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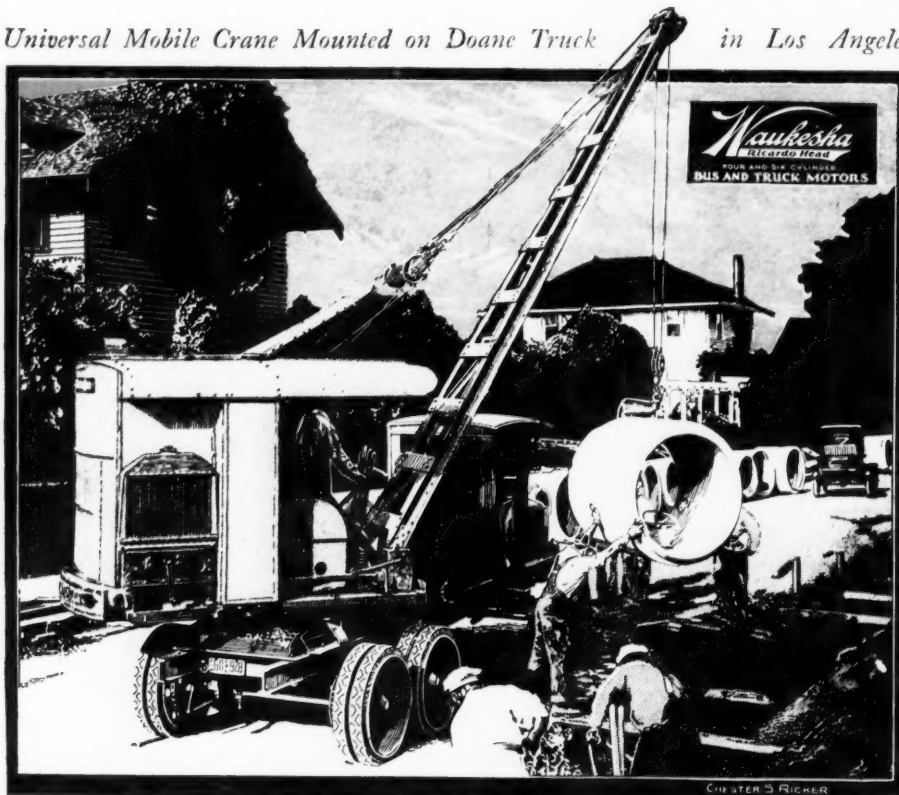
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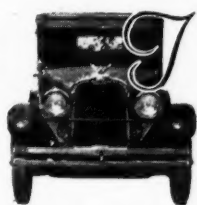
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Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

Offsetting Downward Profit Margins 1927 Task

Net earnings of most automotive companies dropped last year, although output increased. Still possible to cut production expenses.

By John C. Gourlie



THE adding machine tells an interesting story of the motor car industry in 1926. Profits per unit of production were so much lower than in the previous year that net profits for a majority of the manufacturing companies went into a decline in the face of record-breaking production and sales for the industry and for many of the companies.

The trend thus shown is not a new one, but it was accentuated last year and analysis of the records of the past decade probably would not reveal a single year in which new sales records were set that did not show an advance in net profits for most of the companies participating in the gains. When a producer has a big gain in output and a marked decline in earnings a rather unusual industrial condition is offered for consideration.

The inevitable reflex to this situation took place in 1926 and there was a general decline in the stock market prices of the securities of the motor group. A few individual companies gained, but the vast majority lost. With due regard to the vagaries of speculative activity on the exchanges, there is little doubt that the high level of automotive securities at the beginning of 1926 represented a fair appraisal of the stocks based on the record of 1925. Liquidation took place when it was

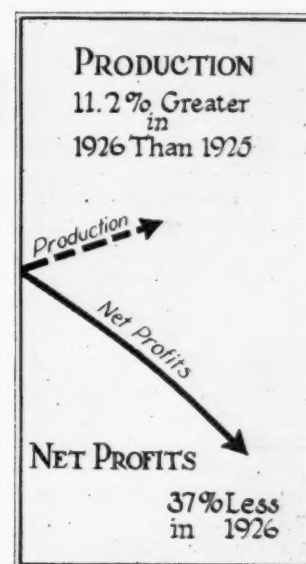
seen that, despite the healthy state of the market for automobiles, profits for many of the companies would be lower as the result of price-cutting.

As tending to show that motor stock prices at the beginning of 1926 were not over-inflated by speculation, there is the fact that the few companies which were able to better their earnings during the year had a higher market appraisal at the end than at the outset of the twelvemonth.

Based for convenience on common stock prices at the closing on Jan. 2, 1926, and Jan. 3, 1927, the market value of the motor companies listed on the New York Stock Exchange increased in 1926 from \$1,649,438,000 to \$2,051,805,000. This, however, was more than accounted for by the rise in the market valuation of General Motors, amounting to more than \$670,000,000. The totals of 13 other companies declined from \$911,030,000 at the beginning of the year to \$746,805,000 at the end, a drop of more than \$164,000,000, or 18 per cent.

Nash was the outstanding exception. This company's valuation on the stock market scale increased from \$139,500,000 to \$187,000,000, or \$47,500,000, which materially helped the showing for the group as a whole.

As will be shown later, both Nash and General Motors were able to make major increases in production without sacrificing unit profits, and this was the reason for their enhanced value. All these figures would be more



The above is a graphic illustration of what happened in the industry last year. While production went up, net profits came down. The percentages are based on the operations of the car companies whose stocks are listed on the New York Stock Exchange, exclusive of General Motors Corp.

Comparative Value of Automotive Stocks, 1926-1927

Companies shown in tabulation below are those whose stocks are listed on the New York Stock Exchange

	Closing Price Jan. 2, 1926	Total Shares Outstanding	Market Value	Closing Price Jan. 3, 1927	Total Shares Outstanding	Market Value
Chandler	26 ⁺	280,000	\$7,280,000	9	280,000	\$2,520,000
Chrysler	213	677,910	144,392,700	41	2,705,000	110,905,000
Dodge	46 ¹ / ₂	1,935,000	89,977,500	26	1,935,000	50,310,000
G. M.	124	5,162,000	738,008,000*	150	8,700,000	1,305,000,000
Hudson	117 ¹ / ₂	1,330,150	155,633,400	35	1,596,660	87,816,300
Hupmobile	28	913,800	25,586,400	22	1,005,200	22,114,400
Jordan	51	126,000	6,426,000	21	126,000	2,646,000
Moon	36	180,000	6,480,000	12	180,000	2,160,000
Nash	465	300,000	139,500,000	68 ¹ / ₂	2,730,000	187,005,000
Packard	43	2,614,700	113,432,100	36	3,004,300	108,154,800
Pierce-Arrow	37 ¹ / ₂	328,750	12,173,000	22	328,750	7,232,500
Studebaker	59	1,875,000	110,625,000	54	1,875,000	101,250,000
Willys-Overland	32	2,527,050	80,865,600	22	2,527,050	55,595,100
Paige-Detroit	26	676,500	17,589,000	11	676,500	7,441,500
Total			\$1,647,966,000			\$2,050,643,000
Excluding G. M.			909,958,000			745,643,000

* Inc. 960,000 minority shares Fisher Body at 102 later acquired.

⁺ Price as of Feb. 13—new stock.

striking if there was an accurate index of the profits and valuation of the Ford Motor Co., which has, of course, preceded the rest of the industry in lowered unit profits and has now reached an *impasse* that reveals more clearly than could any amount of theoretical explanation the fallacy of depending upon continued price-cutting as a sole means of satisfactory industrial progress.

The Ford Profit Curve

The history of Ford was of constantly increasing profits for a long period, despite price-cuts. But Ford had found the secret of mass production and was able to put it into practice ahead of his competitors, so that for a time he was able by lowered costs to compensate for the lower list prices. When he drew near the limit of economy his profits remained stationary for a time while production continued to grow, then profits began to decline while production still grew and finally, to all appearance, both went down, although his profits for 1926 are not yet known.

Net profits and profits per unit for approximately the same companies that went into the stock market valuation analysis are shown in another accompanying table. The profit per unit figure is given with some hesitation, and with full realization of the fact that the published financial statements of the automobile companies do not give the basis for an accurate determination of the returns from an individual unit of production. But it is believed that the rough approximation possible does sufficiently indicate the trend of a company's earnings with relation to output. In the case of General Motors, with Frigidaire and several subsidiaries selling equipment to outside consumers, the figure is probably more than in other cases a considerable distance from the real one, but there is no evidence that the company's income from sources other than car sales has varied enough in the last three years to make a comparison entirely misleading.

The variation in the companies given in the profits table as compared with the valuation line-up is due to the fact that figures are not yet available for all companies.

Totals for the 13 companies in the table are as follows:

	1926	1925	1924
Net Profits	\$266,685,871	\$230,438,041	\$111,612,899
Est. prod.			
in units	2,426,494	1,895,018	1,298,238
Av. profit			
per unit	\$110	\$121	\$85
Excluding General Motors:			
	1926	1925	1924
Net profits	\$89,987,128	\$123,438,041	\$66,282,011
Est. prod.			
in units	1,192,644	1,059,116	710,897
Av. profit			
per unit	\$75	\$117	\$93

Both 1925 and 1926 showed gains over the years immediately preceding in production and sales. But while the expected gain in earnings, net and per unit, was registered in 1925 for all companies, the majority actually registered losses in 1926 on both counts. Incidentally, General Motors' production gains at the expense of the others in the group under consideration were negligible. The corporation's proportion of production was 51 per cent in 1926, 44 per cent in 1925 and 45 per cent in 1924. Its earnings, however, were 66 per cent of the total in 1926, against 46 per cent in 1925 and 41 per cent in 1924.

Profits Drop 37 Per Cent

Expressed further in percentages, the companies exclusive of General Motors made a gain of 11.2 per cent in output in 1926 over 1925, but experienced a 37 per cent loss in net profits.

The extraordinary point about the table is the virtually uniform trend toward lower per unit profits. General Motors gained, and Nash's loss was inconsiderable; the others all lost. There is a possibility that one or two of the companies that have not yet reported full 1926 earnings will show gains, but not enough to affect the statistics to an appreciable extent.

The urge for big volume production unquestionably is at the root of the most serious problems of the industry.

Profit Trend in Passenger Car Field Since 1924

This table is based on financial statements available at time compilation was made

	1926	1925	1924
	Approximate Profit Per Car	Approximate Profit Per Car	Approximate Profit Per Car
Chandler - Cleveland	Net Profits \$401,329 \$18	Net Profits \$2,470,611 \$80	Net Profits \$1,348,420 \$64
Chrysler	15,448,586 91	17,126,136 126	4,115,540 50
Dodge	21,591,919 65	23,868,366 95	17,520,221 79
G. M.	176,698,743 143	106,484,756 128	45,330,888 77
Hudson	5,372,874 ⁽¹⁾ 22	21,378,504 ⁽²⁾ 81	8,073,459 ⁽²⁾ 63
Hupp	3,507,628 74	3,797,335 102	1,613,600 52
Nash	23,346,306 ⁽²⁾ 170	16,256,216 172	9,280,541 175
Packard	15,750,000 ⁽³⁾ 450	12,191,081 500	4,805,175 300
Pierce-Arrow	1,267,695 168	1,629,781 350	751,060 200
Reo	4,257,920 123	5,422,182 166	3,412,041 139
Studebaker	13,042,119 111	16,619,523 124	13,773,869 127
Paige	500,206 14	2,437,865 58	1,588,085 46
Auburn	949,132 112	755,685 135	Deficit

⁽¹⁾ 13 months ended Dec. 31.

⁽²⁾ 12 months ended Nov. 30.

⁽³⁾ 12 months ended Aug. 31.

They make an imposing list:

1. Unit profits below the point of safety.
2. Excess production capacity.
3. Inflexibility of production units.
4. A declining margin of net profit for dealers.
5. Excess used car stocks.

What's done cannot, of course, very well be undone. There is no way of gaining anything by eliminating surplus production facilities and in a competitive market there is little opportunity for a company to gain by raising prices. But there is every reason to avoid further price-cutting and to depend upon greater economies to rebuild unit profits to the point at which they stood 18 or 20 months ago.

Increasing Dealers' Discounts

It might even be possible—and nothing better for the industry could be well imagined—for the next price cuts, if thoroughly justified by a good market and by considerably lower costs of production, to be made to the dealers in the form of longer discounts. This presupposes, however, a dealer organization that could profit from longer discounts, and would not use them to increase trade-in allowances. The dealers themselves have not been free from the delusion of volume. The answer to losses or to small net profits has been to sell more cars with too often the ultimate result of still lower net profits or still greater losses. They have cut prices too far by loose trading.

In some ways the current situation is more favorable to the small producers than to the large. The little fellows can charge more for their cars because they do not expect anyone and everyone to purchase their products. They have maintained productive flexibility and can meet the demands of a capricious public taste more quickly.

The competitive situation which exists at the present time among passenger car companies is not to be denied. Sometimes in past years individual companies have felt called upon to make temporary moves which they themselves may have recognized as being not wholly in harmony with the best long-swing merchan-

dising policies. Too often, however, some analysts of the industry believe, the effectiveness of such attempts to gain temporary advantage are overestimated. Car price cuts, for instance, they point out, so often merely result in similar cuts by all competitors in a given group with the result that the prices simply are stabilized on a lower level with no individual company much the gainer and the additional profit mostly in the pockets of the public. This only tends toward still lower profits per unit.

Production costs can still be brought down, but not at the rate which prevailed a decade ago. For a majority of the important producers, a big increase in volume will not bring about economies that will justify heavy price cuts. Better merchandising is needed more than lower prices. The public will pay more for what it really wants, as is being demonstrated every day by happenings in the lowest price class sales.

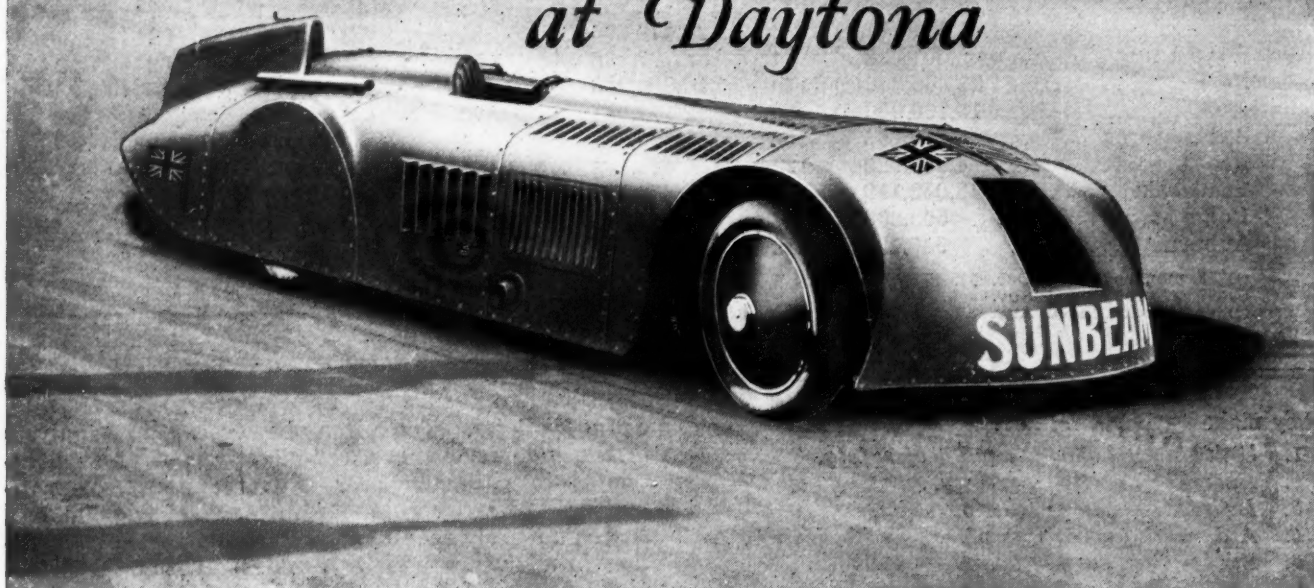
The industry is in excellent condition. The year started slowly but has been picking up rapidly. There is nothing to cause alarm so long as the market is good, prices are maintained on an even keel, and over-production avoided. The producers acted with promptness and dispatch in meeting the slump which took place late last year and it appears that they have come out of the period of lower operations with honor and some measure of profit. They have so far heeded the example of the woolen industry and others where excess capacity has brought about prolonged depression.

Prices Could be Raised

In a few instances prices could be raised with almost certain profit to the producer. An action of this sort can be taken when new models are brought out and the buyers do not then feel that they are paying more for the same product. This was done by one company at the time of the New York Show and the factory is now running full blast. The earnings of this company, unless unforeseen contingencies develop, will be far better for this year than last.

There is abundant reason to believe that the same may be true of the industry as a whole.

200 m.p.h. Segrave's Goal with "MYSTERY CAR" at Daytona



Major Segrave's 1000 hp. Sunbeam racer fitted with two 500 hp., 12-cylinder Sunbeam Matabele airplane engines on the beach at Daytona, where he hopes to set a speed record of 200 m.p.h.

British pilot ready for attempt to set new
record with 1000 hp. Sunbeam.
Car has 24 Cylinders.

By M. W. Bourdon

SOME time, probably on Sunday, March 20, when the tide is low at Daytona Beach, Fla., Major H. O. D. Segrave, veteran British driver, hopes to pilot a specially-constructed 1000 hp. Sunbeam racing car over the hard-packed sands at a greater speed than man has ever yet achieved on wheels.

Two hundred miles per hour or better, he hopes to do. The car he will drive has a theoretical maximum speed of 220 m.p.h.

He declares there is no doubt that the car can do more than 200 m.p.h. on the track, the only question in his mind being whether it is "steerable" at that speed. This point has never been determined, he says; the only way to find out is to try it.

He selected Daytona Beach for his trials, he said, because it is the only place in the world where such a test of speed could be made, with the possible exception of the dry lake bed at Muroc, Cal. Pendine Sands, Wales, offers a course only 5½ miles long, whereas he requires a course 9 miles long if he is to drive his car

at maximum speed and effect a safe stop.

Major Segrave comes to America in the attempt to win back laurels which were formerly his. He was recognized in Europe as the holder of the world's speed record after traveling 149.328 m.p.h. in a 12-cylinder Sunbeam. Faster time than this had been made in the United States on several occasions, but American records were not officially recognized in Europe. Segrave, therefore, was the undisputed speed champion in the eyes of Europe.

Record Broken Twice

Then about a year ago, on April 28, 1926, J. G. Parry-Thomas, another British driver, attained a speed of 170.62 m.p.h. at Pendine Sands. Even this record was to be short-lived, for in February of this year Capt. Malcolm Campbell took a 12-cylinder Napier airplane engined car to Pendine Sands and was clocked officially at 174.2 m.p.h.

That is the record Segrave is out to beat in order to

regain his former standing in European racing circles. He arrived in New York on March 9 and arranged the transfer of his machine to another boat that took him to Jacksonville, Fla. In his party are K. Lee Guinness, head of the company which makes the K.L.G. (British) spark plug; C. H. Freeman, engineer of the Dunlop Tire Co., and eight mechanics.

If the arrangements for the first trial proceed as scheduled, it will take place probably not later than March 20. He does not expect to need more than one or two days to "tune up."

The "mystery car," as it has been termed, has two 12-cylinder airplane engines, one in front and the other over the back axle. Each of these engines develops 500 hp. at its normal rate of rotation, viz., 2000 r.p.m., though if necessary a higher speed and an increased output can be secured.

These engines have their 12 cylinders set in two rows of six at an angle of 60 deg. Each cylinder has four valves and there are four overhead camshafts for each power unit. The bore and stroke are 122 x 160 mm. (approximately 4 13/16 by 6 5/16 in.) so that the piston displacement of each engine is, roughly, 1380 cu. in., or 2760 cu. in. in all. There are four six-cylinder polar-inductor magnetos for each engine and two Claudel carburetors with compressed air feed.

Chassis Frame is Massive

The chassis frame consists of two massive side rails of pressed steel 4 mm. thick, nearly 2 ft. in depth at one point and over 14 in. deep throughout the greater part of their length. The side members extend well behind the rear axle, the extreme end carrying a gas tank with a capacity of 33 gal. At the front there are dual dumbirons on each side, one unit curving down from the top of the frame and the other curving up from the bottom, the two meeting in a bracket on a stout tubular section cross member. Through the



Photo by
Underwood & Underwood

Major H. O. D. Segrave

beetle horn front ends of the frame thus arranged, the front axle passes from side to side, while the rear axle—solid and cranked to pass below the rear engine—passes through an oval-shaped hole in each side member, which at this point has its maximum depth. Each engine, weighing 1100 lb., is mounted on a subframe with three spherical points of support.

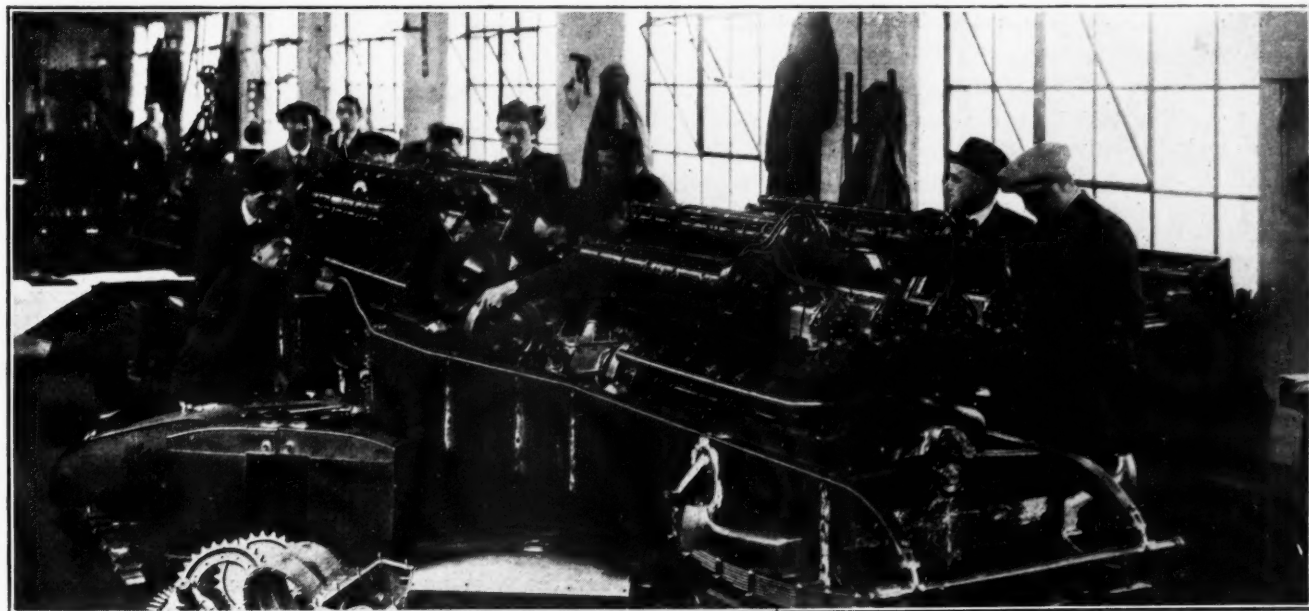
The way in which the two engines are coupled together and to the transmission is a special feature of the design. At the back of the front engine is a large friction clutch, inside of which is a dog clutch and from this extends rearward a shaft coupled up to the rear engine. When the car is to be

used the front engine is first started by compressed air, the friction clutch is engaged and this has the effect of starting the rear engine. At this stage the dog clutch is allowed to engage and thereafter the two engines run solidly together.

In the length of the coupling shaft between the two engines is a multiplying gear connected through the main control clutch to a three-speed gearset, the primary shaft of which is caused to rotate $2\frac{1}{2}$ times as fast as the engines. The main clutch is of the plate type with 11 bronze and 11 steel plates running in oil.

From the three-speed gearset the drive passes to bevel reduction gearing on a universally jointed countershaft having at each end a sprocket for the side chains, which form the final transmission. There is no differential.

Offhand it may be difficult to understand why a multiplying gear on the engine or power side of the main clutch and gearset is used and a reducing gear on the other side of the gearset. The idea is to make it possible to use a main clutch and gearset of dimensions similar to those previously used in Sunbeam racing cars, since, with the higher speed of the shafts, the torque stresses on teeth and shafts are less than they



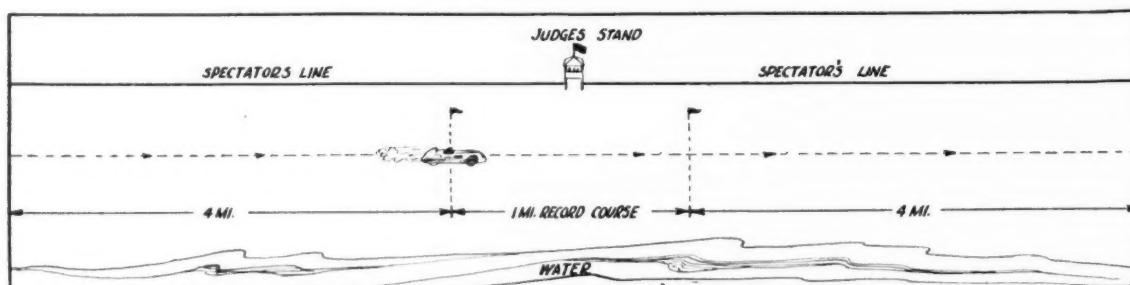
The 1000 hp. Sunbeam racing car in process of erection. This view shows the engines, the depth of the frame side-rails and the dual front dumbirons

How the Sunbeam Speed Trials Will be Conducted

THE Sunbeam speed trials at Daytona Beach, Fla., will be conducted under rules laid down by the Contest Board of the American Automobile Association and any records which are made will have official standing in Europe by virtue of the recent affiliation of the A.A.A. with the International Association of Recognized Automobile Clubs.

All arrangements for the trials are in charge of Val Haresnape, secretary of the A.A.A. Contest Board. There will be at least three official judges who will have control of the carrying out of the trials in accordance with the rules of the A.A.A. One of the judges will be T. E. Myers, manager of the Indianapolis Speedway. The clerk of the course will be Frank Pierson, secretary of the Daytona Beach Chamber of Commerce. The chief timer will be Odis Porter, of Indianapolis, one of the Contest Board's official timers. He will use the timing machine that is used at the Indianapolis Speedway. This machine records automatically the passage of a car to the hundredth part of a second. The accuracy of the controlling chronometer was recently checked by the Bureau of Standards.

The accompanying sketch shows the arrangement of the course. A strip of beach nine miles long has been staked off by a surveyor. In the center of the course the mile over which Segrave



Nine-mile course at Daytona Beach as laid out for Sunbeam trials

will be timed has been measured and marked with the utmost precision. A kilometer also has been marked off so that he can be timed over both distances, as the kilometer is the unit of measurement generally used in European records.

The spectators will be kept well back from the beach, on a line established along the sand dunes. The judges and other officials of the trials will occupy a post facing the center of the course. Segrave will start his car at one end of the course and will have four miles in which to attain maximum velocity. He will be timed over the fifth mile and will then have four more miles in which to effect a stop.

The A.A.A. will name a technical representative whose duty it will be to weigh the car and check up on its stroke, bore and piston displacement.

Telephones will be installed along the course at one-mile intervals to keep the officials in touch with each other and for use in case of accident.

would be at engine speed. But for this arrangement an immense clutch and an equally immense gearset would be required, calling for a chassis very much higher off the ground; moreover gear shifting would be an extremely heavy and difficult operation. As it is, the clutch can be operated and the gears changed as easily on this car as on an orthodox car of one-twentieth the horsepower.

As indicating the size of the gears that are considered necessary to transmit engine torque directly, it may be said that the reducing gear on the power side of the three-speed gearset has teeth 55 mm. wide,

the overall diameters of the driving and driven gears being respectively 13 in. and 5 in.

The driver's seat is located between the two engines, each of which has its own radiator, though for the power unit behind the driver the radiator is in two parts and provided with cooling draughts that enter the body interior through large louvres on either side.

Apart from engine starting the controls are normal, though the steering gear ratio is somewhat higher than usual in view of the high speeds that are anticipated.

The car, it will be realized, has no direct drive; nevertheless the efficiency of the transmission is said to be

approximately 85 per cent on the top gear ratio, which is 1.017 to 1. The other ratios are: Second, 1.56 to 1; first, 2.968 to 1, and reverse 2.6125 to 1. At the normal engine speed of 2000 r.p.m. the theoretical road speed is 73 m.p.h. on bottom gear, 138 m.p.h. on second and 212 m.p.h. on high.

The calculated maximum speed of the car is about 220 m.p.h., at which speed 3.53 miles will be covered in one minute. A point of particular note is that in covering one mile each of the engines will make 546 revolutions.

Four-wheel brakes, pedal-operated through a Dewandre vacuum servo, are used; a hand lever actuates the shoes in the rear drums only. The rear drums are 19 in. in diameter, the front ones 18 in., both with a friction surface $2\frac{3}{4}$ in. wide. The shoes have cast-iron facings.

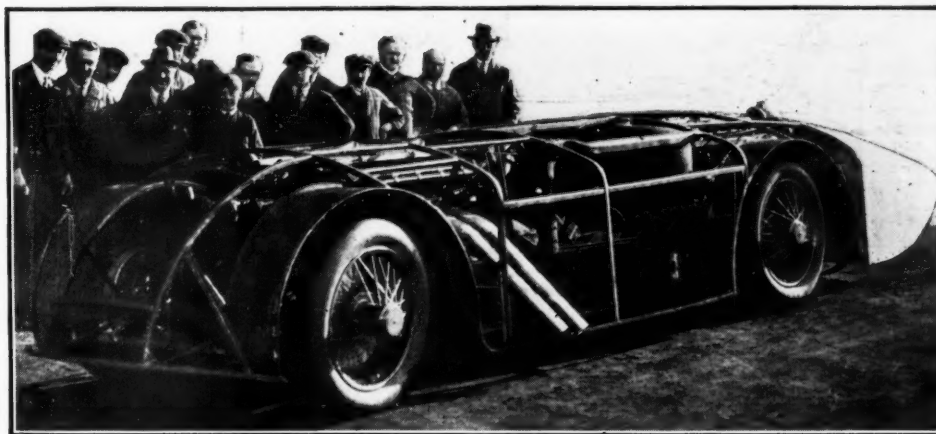
The wheelbase of the car is not excessive, being 141 in.; the track, however, is wider than usual, viz., 62 in., while the complete overall length is 23 ft. 6 in. and the overall width 72 in.

Tires Have Thin Treads

Specially made Dunlop high-pressure tires are used (36 x $6\frac{3}{4}$ in.) on wheelbase rims with security strips. The tires have very thin treads, for obviously at the high speeds expected a thick tread could not be held to the casing against centrifugal force. The springs fore and aft are half-elliptic, underhung, and are fitted outside the frame at the front and inside the frame at the rear.

The body has been designed after lengthy experiments carried out on models in a wind tunnel that is normally used for testing airplane resistances. It is built in sections of sheet aluminum on a framework of angle section steel. In appearance it resembles an immense garden slug; the top, which incloses both of the engines and the rear wheels, is only 46 in. above the ground and the ground clearance at the lowest point is, roughly, 7 in. Only the top of the driver's head projects above the body shell and his line of vision when the car is at rest strikes the ground no nearer than about 100 yards ahead. Armour plates are fitted around the tires (the rear wheels are completely inclosed) and around the driving chains to guard against damage in the event of a tire tread or chain flying off at speed.

To give the driver a



The Sunbeam racer with the aluminum panels removed from the body framing

reasonable chance of escape from serious injury in case of accident two provisions have been made. The first is an undershield of steel plate 6 mm. (roughly $\frac{1}{4}$ in.) in thickness, the idea being that the car will slide along the ground on this shield if by any chance a wheel should come off. Secondly, in front of and behind the driver are stout steel hoops within the body to prevent it from being crushed in if the car overturns.

The actual wind resistances at various speeds are as follows:

Speed	Wind Resistance
180 m.p.h.	740 lb.
190 "	830 "
200 "	920 "
210 "	1020 "

Experiments have shown that there will be some remarkable forces at work when this car runs at its maximum speed. In the first place, air pressure on the front portion will tend to force the "nose" and wheels into the ground, and at the rear end a smaller force will try to raise the tail. Roughly, the pressure downwards on the nose is 700 lb. while lifting pressure at the tail is 200 lb. It is estimated, too, that at a speed of 200 m.p.h. something like 500 hp. will be necessary to overcome wind resistance alone, despite the best possible streamline shape having been adopted for the body in view of the limitations imposed by the size and positions of the two immense engines.

Before leaving England, Major Segrave drove the car around the yard of the Sunbeam factory to demonstrate its tractability. He was able to keep a speed of about 18 m.p.h. in low gear, which means that the engines were turning over at the rate of 500 r.p.m. As was to be expected, firing was somewhat irregular at this low speed.

Fastest Mile Ever Driven in America

THE fastest mile ever made by automobile in America is credited to Tommy Milton. Driving a 16-cylinder, twin-engined Duesenberg Special at Daytona Beach on April 27, 1920, Milton covered the distance at the rate of 156.04 m.p.h. The car was fitted with two 8-cylinder engines placed side by side, each driving one rear wheel, and the total piston displacement was 583.8 cu. in.

Milton's machine was a pigmy compared with the one which Segrave will pilot. The latter is powered by two Sunbeam Matabele 12-cylinder airplane engines, one at each end of the frame, with a total piston displacement of 2760 cu. in.

A still more striking contrast is obtained by comparing the Sunbeam with the tiny $1\frac{1}{2}$ liter ($91\frac{1}{2}$ cu. in.) cars which are now used in A. A. A. contests on American speedways. The piston displacement of the Sunbeam amounts to about 45 liters or 30 times that of the little racers.

Five Companies Tell How They Keep Their Plants Clean

Proportionate number of men employed in cleaning work varies considerably. Incentive wage systems used in most cases.

By K. W. Stillman

THE task of keeping a plant clean, while perhaps not of major manufacturing importance, presents real difficulties to most managements. Possibly this is due in large measure to the fact that cleaning constitutes another source of indirect expense, and indirect expense is something for which most managers have no kindly feelings. Plants must be kept clean, however, and the job of planning the work in such a way that maximum results may be obtained with a minimum of that *bete noir*, indirect expense, is important.

We have obtained rather detailed information concerning the methods employed by five representative automobile manufacturing companies to keep their plants clean and in the experience of these companies others may find some useful suggestions.

The proportionate number of men employed in cleaning work appears to vary considerably, as can be seen from the accompanying table. When possible it is generally considered advisable to put all workers on some sort of an incentive wage system and this has been applied even to floor sweepers in many cases. Such a task as keeping the plant clean does not appear to lend itself readily to incentive wage payment plans but apparently it is possible to institute such system with, probably, as satisfactory results as are obtained in other kinds of work.

Mechanical Waste Conveyors

When the quantity of waste material turned out by a production department is large the use of mechanical handling equipment to dispose of it is immediately suggested and this suggestion has been followed in many plants with a resulting saving of labor cost.

The question of how often floors should be swept or windows cleaned is one which apparently, cannot be answered definitely because of the many other factors which must be considered. From the experience of the plants considered in this survey a daily sweeping of all floors appears to be the minimum requirement. In general, the responsibility of keeping the plant clean is placed upon the plant manager who usually delegates direct supervision of the task to someone whose regular work seems to fit him for this responsibility.

Nearly all automotive plants realize, apparently, that plant cleanliness is as much a subject for preventative measures as for cures. Regular clean-up campaigns, bulletins, and various other measures are commonly used to keep the subject in the minds of the personnel and the results have usually been as satisfactory in preventing unnecessary dirt as safety campaigns have been in lessening the number of accidents.

In the Paige-Detroit Plant

In the Paige-Detroit plant 13 men and a foreman clean the machine shop, motor assembly departments and chassis assembly department, while the stock department, final test and inspection departments do their own cleaning work.

Only two of the companies had available information regarding the ratio of the cleaning force to total indirect labor force. In one case it was 1 to 3 and in the other 1 to 11. In two plants, also, the ratio of cleaning payroll to total indirect payroll was available and was shown to be 1 to 3 and 1 to 16, respectively. One company was able to furnish the ratio of cleaning material expense to total indirect material costs as .08 of 1 per cent.

**Proportionate Number Employed in Cleaning Work
in Five Automobile Plants**

	No. of workers in cleaning force	Ratio—Cleaning force to total indirect labor	Ratio—Cleaning force to total working force	Ratio—Cleaning payroll to total indirect payroll	Ratio—Cleaning payroll to total labor payroll
Chrysler	1-65
Dodge	400	1-11	1-59	1-16	1-94
Nash	128	1-3	1-37	1-3	1-43
Paige	14	...	1-89	...	1-64
Name withheld	265	...	1-50	...	1-60

The methods of paying the cleaning force vary considerably. Chrysler applies the group bonus plan that is employed for all its workers.

In the Dodge plant the men cleaning floors are paid an hourly rate plus a bonus based on their previous performance. For window cleaners a piece rate based on 100 sq. ft. of glass cleaned is employed. The main office is cleaned by contract by an outside agency while all other cleaners receive a straight hourly rate.

Nash makes use of day and piece rates for its cleaning force. Paige uses day rate while another large producer uses day rate principally but in a number of instances employs a task basis, such as to keep a certain portion of the plant clean to suit the general foreman. On such jobs as window cleaning piece rate is used in this plant.

Most of the plants make use of mechanical equipment wherever it will facilitate the cleaning job. Chrysler employs blowers extensively in woodworking departments and other places where the refuse is light enough to be handled by this means. Dodge employs a vacuum cleaning system in the offices, and chip crushers, sheet steel balers and briquetting machines—all provided with the necessary conveyor equipment—in the plant.

Nash Belt Conveyors

In the Nash foundry, electrically-charged belt conveyors are used to sort out iron and steel bits from the core and molding sand which is being carried into the overhead hoppers; the salvaged pieces being taken to a dump. In the forge, belt conveyors are used to carry out scrap trimmings, which are deposited in a wheelbarrow for transportation to the scrap bin.

In the Paige plant, metal chips, turnings and borings are accumulated in trunnion barrels, of which there are enough to contain all the chips produced during the day. These are removed after working hours by the cleaning gang, which starts and finishes its work an hour later than the regular working force. For stringy and bulky chips concrete buggies are employed. All chips are taken directly to freight cars.

Another company has a rather well-developed mechanical system of disposing of waste. A tunnel runs through the center of the machine shop and is connected with the various department by conveyors and chutes. In the tunnel are trailer chassis upon which steel scrap boxes are placed. Waste materials are carried by the conveyors to these boxes which, as fast as they are loaded, are hauled by tractors to the salvage department just outside the building. Separate chutes and trucks are provided for each kind of waste material so that in the salvage department the boxes are lifted off the trucks by cranes for immediate delivery to the proper storage point or to freight cars.

Frequency of Cleaning

The frequency of cleaning floors and windows depends, obviously, upon the particular conditions, but some indication of how this point is handled in the plants being considered should be of value. Chrysler sweeps floors hourly, twice daily, daily, etc., while the windows are cleaned by outside contractors on a definite schedule based upon the work performed within.

In the Dodge plant all floors are swept daily while windows are cleaned on an average of every two months although this schedule is influenced by particular conditions. At Nash, too, floors are swept daily while windows are cleaned according to the particular conditions.

At the Paige plant all floors are swept twice daily and swabbed down once a month. Windows are cleaned according to a schedule which provides from one to four cleanings per year, depending upon their location. In the fifth plant most floors are swept daily with some being cleaned twice a day. Windows are cleaned four times a year.

The allocation of responsibility for maintaining plant cleanliness varies a bit among the plants here considered, although the plant manager, of course, has indirect charge, at least, of all this work.

At the Chrysler plant, cleaning work comes under the supervision of the plant management with specially selected men in direct charge of the work. At Dodge, too, the departments doing cleaning work are under the direct control of the factory manager's office. The works engineer of Nash, who has charge of plant maintenance, has charge of cleaning there, while at the Paige plant this work is under the supervision of the maintenance department.

Each Division Has Own Cleaners

In the other plant, each productive division has its own labor department for cleaning the inside of buildings located in the division. These labor departments are directly under the supervision of the superintendent of the division. A general maintenance department looks after the cleanliness of the yard while window washing and similar items of a general nature are supervised by the production manager.

Periodic clean-up campaigns are used by Chrysler to keep interest alive in plant cleanliness. General letters are issued to all Dodge foremen calling their attention to the importance of cleanliness, and signs are posted throughout the plant directing employees where to dispose of waste paper, etc.

In the Nash plant bulletin boards are employed to keep the subject of cleanliness constantly before the employees while verbal and written suggestions to department heads keep them interested in cleanliness.

In the fifth plant all men, when hired, receive a booklet containing instruction on plant cleanliness. Each department is equipped with waste cans for receiving deposits of all refuse. Walks outside the plant and all stairways and similar places are policed daily.

Walls and Ceilings White

Chrysler paints both walls and ceilings of its plant white with stair corners treated in the same way. Heavy presses are painted each month for safety reasons as well as for cleanliness while smaller presses are painted semi-yearly. Moving or dangerous parts are all painted a conspicuous color. Shipping crates, movable bins, refuse cars and similar containers are plainly identified so that they can be returned to their proper storage place at the end of the day without trouble.

Dodge keeps aisle lines painted on all floors by means of a plant-made contrivance which paints a 2 in. wide strip as it is pushed along the floor. These lines are renewed every two weeks in the machine shop and every four weeks in other departments. A flat white paint is used for this purpose. The corners of all passenger elevators are painted white every four weeks.

In the fifth plant cuspidors are placed in each corner of stairway landings and in conspicuous points throughout the plant. All locker and rest rooms and toilets in this plant are cleaned and fumigated at least once daily.

Coordinated Transport Need Not Mean Rail Dominance

Bus manufacturers do not have to engage in "open warfare with existing transportation systems" to follow marketing policies which do not always fit plans of rail carriers.

By Norman G. Shidle

COMMENTING on our recent article, "Has Coordination with Railways Hurt Bus Manufacturers?" *Aera*, the organ of the American Electric Railway Association, quotes some of our paragraphs and then reads into them new meanings as follows:

"Denuded of any subtlety, they (the questions we propounded) ask whether it would not be good business judgment for the bus manufacturing industry to encourage competition with steam and electric railways, to sell buses wherever there might be a buyer, to assist would-be buyers to engage in competition with rail lines, to throw over any pretense of cooperation and to engage in open warfare on the established rail transportation systems."

As a matter of fact, that isn't what the questions asked. No sane man today would urge as a sound policy for bus manufacturers "to throw over any pretense of cooperation and to engage in open warfare on the established rail transportation systems." Such a policy obviously would be subversive of the public interest and consequently unsound and unprofitable merchandising practice for the bus manufacturer in the long run. Certainly *Aera* is entirely correct when it states that "if the bus manufacturing industry should be so foolish as to attempt to revive jitney competition by encouraging prospective buyers of buses to apply for franchises in competition with established rail lines and by offering them financial assistance, it will have only itself to blame for more failures of the kind that have cost some bus manufacturers many thousands of dollars." Sale of buses to irresponsible operators, just as sale of trucks to similar classes of buyers, has resulted in considerable harm in the past and should be discouraged rather than encouraged in the future.

A Different Point

The point is not whether bus manufacturers should cooperate with rail lines or engage in open warfare with them. Rather it is whether bus manufacturers are prepared to mould every single merchandising move along lines entirely approved by rail interests or whether, in certain instances where the rail line conceivably may be taking a stand based more on selfish interest than upon pure consideration of public transportation welfare, the bus manufacturers might risk the displeasure of the rail interests in these specific cases rather than fail to express an honest conviction.

There are those among students of transportation matters, for example, who honestly believe and purport to have facts to prove that the motor bus is capable of handling mass transportation—in certain instances per-

haps better than the surface trolley lines. The question which we raise simply is this: Should those men in those instances refrain from publicly stating that opinion, marshalling facts to prove it if possible and try to sell the public on their side of the case for the sole reason that such action would be displeasing to existing rail interests?

That a coordinated system of transportation is the basic need of our cities and suburbs is almost universally agreed. But to admit the basic need of a coordinated system of transportation is not necessarily to admit that existing rail carriers shall be the *sole judges* of when, where and how the bus shall fit into that coordinated system. The well-known public in the long run, it seems generally agreed, will be the *final arbiter*, but the feeling of the public toward buses—the newer form of transportation—is going to be influenced strongly by what it sees, hears and learns about buses. If the development of bus use be left entirely to the whims of the existing rail interests, it seems almost certain that the public will not be told about bus possibilities with as much enthusiasm, initiative and thoroughness as if bus manufacturers themselves set out to tell the story of their own medium of transportation.

Possibilities of Production

Bus manufacturers may well realize, as *Aera* suggests, that "the possibilities of bus production are not unlimited," but at the same time hesitate to leave entirely in the hands of rail interests the determination of what those possibilities are. Coordination, as G. Lloyd Wilson of the University of Pennsylvania so aptly points out in *Automotive Industries* of March 12, does not necessarily mean the domination of one transportation interest by another.

It should be perfectly clear that to urge bus manufacturers to refrain from complete subordination to the ideas of rail carriers regarding bus use is in no sense urging them "to engage in open warfare on the established rail transportation systems." This thought can well be emphasized without retreating from the statement that rail interests in many cases have adopted buses only with the greatest reluctance and only after rail service simply could not meet the demands for public service.

Aera states as a definite and universal condition a situation which exists only in some cases while it is absent in many others when it says: "The electric railways regard the bus as they do any other new tool or device that improves their service and increases their

(Continued on page 451)

Just Among Ourselves

Figuring Out Where Congress Left Us

SPENT a day in Washington last week and found everybody trying to ascertain where everything had landed as a result of the Congressional balloon ascension during the closing hours of the lame-duck session. So far as we could learn, nothing vital has been lost from an automotive standpoint as a result of the failure of the deficiency bill. The Department of Commerce lost about \$900,000 in the bill, but the Bureau of Foreign and Domestic Commerce, one of the most important single units of the Government from an automotive viewpoint, didn't lose anything. Washington always is full of politics and politicians, but at the present time it seems to be drowned in them. With 1928 looming ahead, many decisions of the next 12 months are going to be determined by possibilities of political advantage just as much as by economic needs.

* * *

Prospects Good for Tax Elimination

PROSPECTS of automotive tax elimination seem to be bright. With Secretary Mellon quoted as having said in a conference that he does not place automobiles in the category with tobacco, chewing gum and theatre tickets, and with James C. McLaughlin, Michigan representative on the Ways and Means Committee, committed to push for elimination of the nuisance taxes, there seems a good chance of getting the taxes off at the next session once and for all. In many ways, McLaughlin is a key man in the situation, as the prospects for elimination would not be good if the Michigan member of the Ways and Means Committee opposed such action. As matters stand today, the movement to eliminate the automotive war taxes

seems likely to get some real Republican influence added to the Democratic support which it has had for several years. It is even within the realm of possibility that the proposal to eliminate these taxes may be made an administration measure.

* * *

Car Sales and the McNary-Haugen Bill

OPINIONS differ strongly, of course, about the probable effect on sales of motor vehicles and other products in farm areas as a result of the President's veto of the McNary-Haugen bill. One important official, however, whose economic views are particularly respected, expressed the view in an informal conversation that the country almost certainly would have had a depression within a year had the bill gone into effect, while business immediately would have become cautious and slowed down as a result of the psychological influence. In any case, the bill didn't become law, and there are more reasons to believe that farm business will be better as a result than to believe that it will be worse.

* * *

Always Something to Break the Monotony

WE sometimes wonder if everybody connected with the automobile industry realizes what a wonderfully interesting business they are in as compared to a lot of more drab and unchanging lines. Scarcely a week goes by in the automobile industry that something new isn't brought out. Right now, for example, we are in a period of comparative quietude as regards new car models. The big flock of new things for the shows have been exhibited and the mid-summer announcements haven't come along yet. But still something new is be-

ing announced all the time. Since the shows we've had the LaSalle, some new Nash body models, some detailed changes in the Dodge and certain mechanical revisions in other lines, not to mention several price cuts which have provided everybody with something to think about. There are nearly ready for announcement at least one or two new models which probably will come along before the usual summer group. And in the parts and accessory, as well as in the factory equipment field, developments and improvements are moving through almost daily. To the workers in no industry so well as to those in the automotive field can be applied Stevenson's line—"The world is so full of a number of things, I'm sure we should all be as happy as kings."

* * *

The Reasonable Profit Per Unit Problem

IT becomes more evident as the weeks roll by that one of the big tasks before automotive executives in 1927 is going to be that of holding prices to such a level as will permit reasonable profit per unit even though plants aren't kept operating to capacity. Price competition in the parts and supply field continues to be very keen; one producer in a particular line often precipitating lower prices for his whole field by making an individual price cut. Car and truck makers can't be blamed for taking advantage of price competition in buying, but continuance of stable sources of supply has to be considered as an important element as well as price. Sufficient quantity of stable sources can be maintained only if a majority of sound, reputable producers in the particular field consistently can sell at a price which will yield a fair profit per unit.

—N.G.S.

High-Speed, Inclosed Type Diesel Engine Built by Foos

Employs airless injection and is completely inclosed. Speed range extends from 300 to 900 r.p.m. Pressure lubrication provided. Two, three, four, six and eight-cylinder models.

THE Foos Type L Diesel engine, recently placed on the market by the Foos Gas Engine Co., Springfield, Ohio., is a four-cycle vertical engine of comparatively high speed and may be said to be of the automotive type in that it is completely inclosed. It is made in a single size of cylinder only, 8½ by 11 in., but two, three, four, six and eight-cylinder models are made.

The engine employs solid or airless injection, a group of small, individual pumps being provided and interconnected with the governing mechanism. As compared with the conventional Diesel with air injection, combustion takes place in a more explosive manner, the time available for expansion at the higher speeds being very short. The speed range extends from 300 to 900 r.p.m.

This type of engine is adapted for stationary power plant work, for the propulsion of rail cars, etc. All parts are completely inclosed, to reduce the need for attendance to a minimum, the only visible moving part being the main drive shaft extension. Openings are provided for inspection and adjustment, and are closed by quickly removable cover plates.

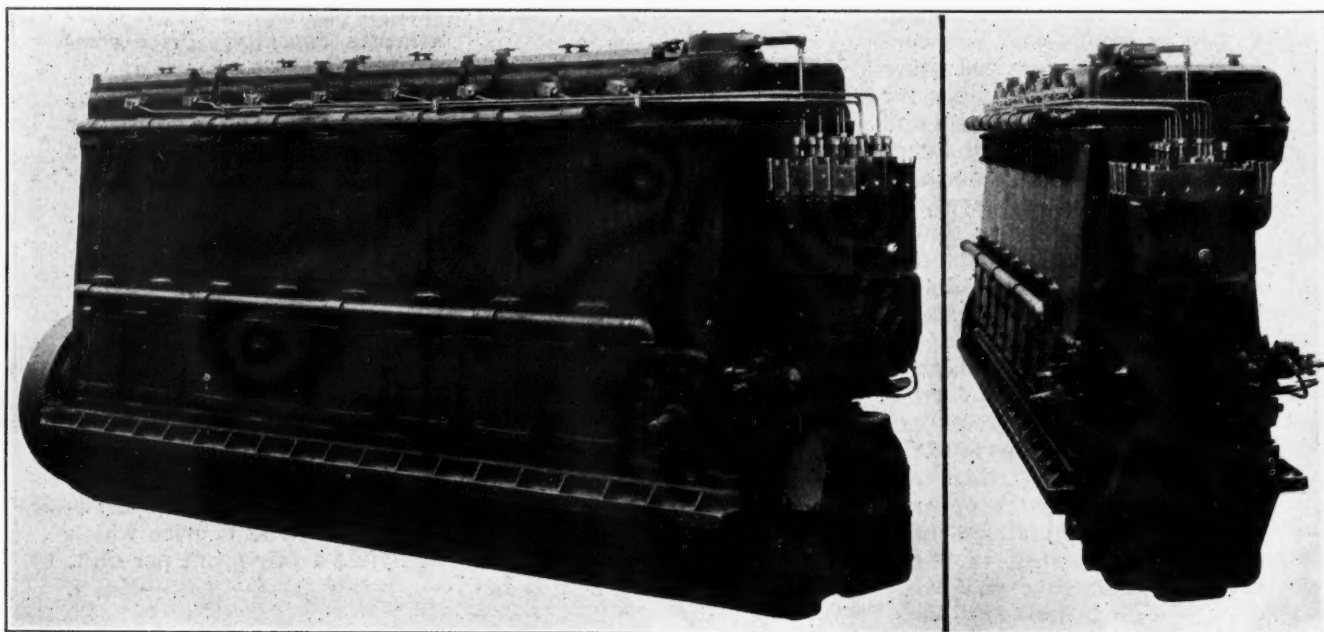
The frame consists of two major castings, the base

and the cylinder block. The cylinder block carries the cylinder liners, cylinder head, etc., while the base supports the crankshaft and the main bearings. Two flanges extending the length of the base serve to support the whole engine.

Pressure lubrication has been adopted in carrying off the heat generated in the bearings, and a method of fitting which assures good metallic contact between the metal of the base and the bearing shells and tends to prevent overheating. The bearings in the base are bored out with the caps in position, with shims between them and the base, and after this operation the bronze-back, babbitt-lined bearings are scraped to a close fit in the bores.

In scraping, the lower shells are clamped down tight, approximately the same as when the shim and cap are in place; if this were not done the horizontal diameter would be greater than the true shaft diameter, although the bearings would appear to be perfect when free. During the scraping-in operation the shaft is "barred over" by hand, no attempt being made to "iron down" high spots by power.

An important feature with these shells is that of sub-



Side and end views of the Foos Type L eight-cylinder Diesel engine

stitution of upper for lower by the simple process of drifting out the hollow dowel in the cap and "rolling" the lower out and the upper in. Such substitutions should be made with due regard to the possibility of imposing too much load on an upper shell thus rolled under. The real value of this construction, however, lies in the fact that it permits putting in new bearings if the occasion should arise, since the new unscraped bearing can be rolled under and marked, rolled out and scraped, the original clearance given at the factory being sufficient to allow the shaft to rise over an unscraped shell.

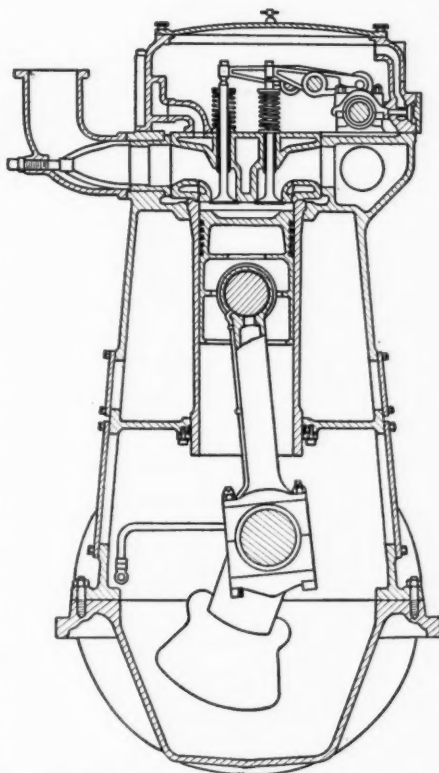
The crankshaft is a solid forging with integral flywheel and coupling flanges and with cast-steel, bolted counter-weights. In the two-cylinder engines the throws are set at 180 deg., for best balance, while in the engines with more cylinders the crank arrangements correspond to conventional practice. For the eight-cylinder engine such a firing order was chosen that explosions in adjacent cylinders never follow one another directly. That is to say, out of eight possible orders there are four in which at least one cylinder is skipped at every successive explosion, including 1-5-7-3, and 1-4-2-6. Such a firing order is thought to be desirable because the loads due to the pressure of the compression and firing strokes are not concentrated to the same extent as when adjacent cylinders fire in succession.

The cylinder block is a one-piece, box-like casting having a horizontal partition at about the height of the piston pin when the crank is in the lower dead center position. Another horizontal wall at the top of the casting supports the top ends of the liners and the cylinder heads; it is ribbed and braced to the sides, while the lower partition is ribbed to arches and flanges through which pass the bolts securing the base to the cylinder block.

The liners are provided with an external flange at their upper end and a water-tight joint with the upper partition of the cylinder block is secured by placing a gasket above and another below the flange. These gaskets are not indicated in the cross-sectional view shown herewith. Where the liners pass through the lower partition a regular stuffing box is provided, which is packed with a molded rubber ring containing a high percentage of pure rubber. Owing to the comparatively high temperature attained by the liner in service, this ring will be vulcanized to it. Renewal of a liner is an easy matter; it is only necessary to remove the cylinder head, and the liner can then be withdrawn.

The pistons are of cast iron and are fitted with several straight-faced and bevel-faced rings. Lubrication of the cylinder walls is by spray from the crankshaft. Piston pins are hollow and fixed in the piston bosses, being driven in (not pressed in), so that they can be removed from the pistons in the field. Each pin is further secured by set screws and a snap ring at the large end. Piston pin lubrication is by pressure, through a tube fastened to the shank of the connecting rod.

To aid in cold starting, the top of the piston is made convex, and the piston head is drilled and tapped to take



Sectional view of Foos Type L
Diesel engine

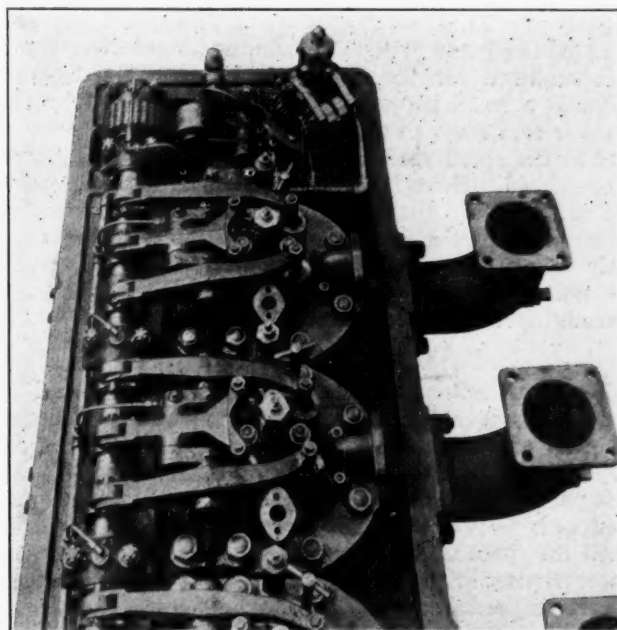
eye bolts for lifting and handling. The connecting rod which in the latest design is an I-section forging, has the cap held on by four bolts, with laminated shims between it and the rod. Crankpin bearings are of the bronze-back, babbitt-lined type and are scraped in individually in the same manner as the main bearings. The upper bearing is a plain bronze bush which is pressed in and then doweled in place.

Cooling water enters the block jacket directly above the lower partition wall and flows up through two openings into the jacket of the cylinder head. This upward flow of the water tends to maintain the liners at a low temperature, which favors lubrication, and keeps the cylinder heads at the maximum temperature, which favors combustion.

Two inlet and exhaust valves are used, which permits of better utilization of the space available in the head and of keeping down the lift of the valves. It gives a neat arrangement, with smaller lifts, lighter springs and less noise and wear of cams. The inlets are opened

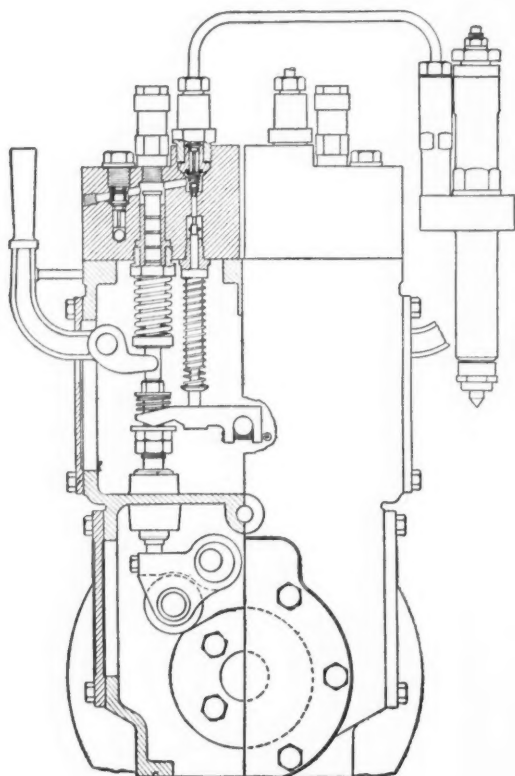
by a single forked lever from one cam, while the exhausts are operated from their cams by curved levers. Valves, springs, pins, rollers, cams, etc., are interchangeable, this offering opportunities for economical manufacture. The cylinder heads support the rocker arm brackets and integral air starting equipment. A small pilot valve is placed in the valve cover near the camshaft. The injector valve is located in the center of the head and is clamped down in place against copper gaskets, the tip being the only part projecting into the combustion space.

The fuel injection pumps are located at the front of the engine and are driven from the intermediate shaft.



Valve-operating mechanism of Foos engine

in the camshaft drive. This shaft is driven at half crankshaft speed, through a wide silent chain, with provision for tightening on the slack side, this adjustment being made for the outside. The pumps have spring-retained plungers in closely fitted bronze bushings. No packing is employed, leakage being prevented by the close fit and by circumferential grooves in the plungers. The packingless feature eliminates the human factor in



Fuel pump and atomizer

making adjustments, since operators are apt to draw down the packing so tight as to bind the plungers.

These pumps work on the constant displacement principle, governing being effected by by-passing a portion of the fuel moved at each stroke. The quantity of fuel required at the full load of 33 hp. at 600 r.p.m. is about 0.023 cu. in., which is equivalent to a drop or globule slightly over $11/32$ in. in diameter. The actual displacement of the pump is 0.095 cu. in. or almost four times that required for the full load charge. The by-pass valve is a small poppet valve which is opened by the plunger cam through the medium of a by-pass lever, so that as the speed varies, more or less of the fuel moved is by-passed. There is no appreciable lag in the governing effect, as the quantity of fuel discharged by the injector valve at each stroke of the pump plunger is exactly equal to that sent into the distributing piping by the plunger, except for the effect of the slight compressibility of the fuel.

Timing of Injection

For a preliminary setting the injection is timed to end at the upper dead center, after which it is advanced to bring up the maximum explosive pressure to the desired point, the injector cams being made adjustable for this purpose. All cylinders of the engine are then equalized with respect to explosion pressure, being adjusted until this pressure is within predetermined upper and lower limits. Since each cam actuates two plungers (three in the case of the three-cylinder engine), equalization of the two cylinders whose injectors served by the same cam is made from the outside by an eccen-

tric rocker shaft which shifts the fulcrum point of the rocker arm. Thus individual adjustment is available, in spite of the dual function of the cams.

The starting point of injection depends on the load, and as advancing the injection increases the explosion pressure, and, consequently, the mean effective pressure, the latter builds up automatically to take care of increasing loads. At no time, however, does injection continue beyond the top end of the stroke, and after-burning, over-heating and smoking due to late injection are thus avoided.

Advantages claimed for the over-capacity of the pumps are that this provides for heavy overloads and for starting, when much heavier charges must be supplied to the cylinders, and that it adds greatly to the useful life of the plungers and bushings.

Power ratings of the different models range from 50 to 475 hp., on the basis of a brake mean effective pressure of 70 lb. p. sq. in. For continuous full duty, speeds of 600-750 r.p.m. are recommended, while speeds up to 900 r.p.m. may be used safely when the full torque load is required only intermittently. Specific weights range between 30 and 60 lb. p. hp., according to the speed and number of cylinders. For stationary use the space economy of the Type L engine is pointed to as an important factor, the 200 hp. engine, for instance, requiring no more floor space than a low-speed, heavy duty Diesel of 25-100 hp.

Motor Carrier Regulation

TWO pamphlets dealing with the various legal phases of motor carrier regulation have been issued by the National Automobile Chamber of Commerce. One prepared by Irwin S. Rosenbaum outlines the various steps which have already been taken to regulate motor carriers by municipal, state and federal governments. The great difficulties which have been encountered in trying to arrive at a uniform method of regulation are brought out, while numerous excerpts from court decisions provide the reader with a good idea of the general opinion among the judiciary regarding motor carriers.

In the second pamphlet the subject is that of certificates of necessity and convenience and an attempt has been made, by resort to court decisions and legislative acts, to determine the exact status of such certificates as a means of regulating common or private carrier operation.

A COPY has been received of the *Handbuch des Reichsverbandes der Automobil-Industrie* (which corresponds to our Handbook of Gasoline Automobiles) for the year 1927, the publishers being Deutsche Verlags-Werke Strauss, Vetter & Co., Berlin. It contains the specifications of German and Austrian passenger cars, motor buses, trucks and special vehicles, such as tractors, fire wagons, etc. An introductory article by Johannes Buschmann, general manager of the German Automobile Dealers' Association, deals with the topic of time-payments and gives in tabular form the terms of the different companies doing an automobile financing business in Germany at the present time. Then follow a list of the members of the association of whose products specifications are included, a table giving the piston displacements, chassis weights and tax horsepower ratings of all passenger cars listed, and a table giving the rated capacities and horsepowers of all motor trucks. Each car and truck is illustrated and the specifications cover more items than it is usual to include in publications of this kind.

Battery Manufacturers Discuss Means of Increasing Unit Profits

Standardization of product and better distribution urged at Philadelphia meeting. Industry hurt by price cutting. Selection of proper retail outlets emphasized.

PLEASE for standardization of their products and for more intelligent study of their distribution problems with the purpose in view of increasing unit profits over their present very low value were made at the meeting of the National Battery Manufacturers' Association held in Philadelphia March 10 and 11.

One speaker told the assembled members that the only significant merchandising action which has been taken by the industry during the past six years has been ruthless price cutting coupled with a lowering of product standards. This has been carried so far in an effort to overcome intense competition that unit profits in the battery field have become considerably lower than they are in most other fields and are below the point where the industry can expect satisfactory net returns from operation.

It was emphasized by several speakers that the lack of proper standards has greatly penalized the industry.

Distribution methods, too, need revision, it was brought out, since in too many cases any sort of a retail outlet has been utilized without regard to its suitability for the work and, particularly, without considering its service possibilities which, it was stated, is, possibly, the most important consideration in establishing retail battery outlets.

Distribution of batteries, like that of all other automotive supplies and equipment, must be widespread if ultimate results are to be obtained. This was emphasized by David Beecroft, Chilton Class Journal Co., as he pointed out that a major portion of motor vehicles are owned and sold in communities of less than 5000 inhabitants. The time is past when batteries or any other automotive product can be effectively distributed through the larger population centers only, he said.

Wants Service Near Home

Mr. Beecroft gave the results of a number of surveys made of consumer habits to show that the motor vehicle owner wishes to obtain all his service as near to his home as possible and, furthermore, he wishes to have to call at as few retail outlets as possible in order to supply all his demands. This condition has resulted in a very marked decrease in specialized retail outlets. Batteries are being sold by dealers, by tire stores, by replacement parts outlets and by any other sort of a retail place which carries other automotive or radio products.

Although this trend is one which deserves very careful consideration of manufacturers, it was brought out by Marquis Regan, market analyst, that in battery distribution particularly, where servicing is such an

important item, it would be well to choose outlets with much more care than is ordinarily used. The mere fact that a store sells tires or some other automotive product is not *prima facie* evidence that it would make a good battery outlet.

Mr. Regan seemed of the opinion that in merchandising as well as in technical development of the product more teamwork was needed among the members of the association if they were to recover from their present unenviable position in which unit profits were dangerously low and competition usually took the form of disastrous price cutting. He cited the example of the United Typothetae of America which, through cooperation, brought an exceptionally competitive industry—printing—out of much the same sort of a condition which now seems to prevail in the battery industry.

Use of Trade Acceptances

Other speakers at the two-day meeting covered a wide range of technical subjects. A talk was presented on the use of trade acceptances in which their use was highly recommended, not as a means of obtaining cash for sales sooner than standard trade terms allowed but as a means of assuring more regular payments of bills than can be obtained with open accounts. The main reason for this was said to be that few purchasers of goods will want their own bank to know that they fail to pay their bills when due and, since trade acceptances are presented through the buyer's bank, he will make every effort to meet them when due rather than have them protested by his own bank.

Another speaker made a very interesting resume of business conditions during recent years and suggested that possibly a new era had arrived in business movements. This opinion was predicated on the fact that during the past two years total production, wages and manufacturing profits have shown fairly substantial gains while prices have declined. This condition is quite unique in business history, according to the speaker, J. F. Dewhurst, Federal Reserve Bank of Philadelphia, and is due in large measure, he believes, to increased efficiency of production whereby output per worker has been notably increased.

A BIBLIOGRAPHY of aeronautical literature published from 1921 to 1925 has just been issued by B. Westermann Company, Inc., 13 West 46th St., New York. The list contains a sketch of the most important books printed in English, French and German during this period. Titles, authors and prices of about 175 books are given.

Good Progress Made Last Year by Some of Smaller Truck Companies

Production gain for industry as a whole was slightly less than 7 per cent. Sales so far this year indicate that 1926 output is likely to be equalled.

AS the truck industry, along with other parts of the automotive business, begins to move into its period of stable growth the results of individual initiative and of special sales and production achievements by specific companies become more marked. While each organization is strongly influenced, of course, by the general conditions affecting the growth of the entire business, study of recent records indicate that the destiny of individual truck companies today lies at least as much in their own operating methods as in the circumstances surrounding the industry as a whole.

Last year truck sales in the United States didn't exceed by very much the total for 1925. Truck production for domestic consumption last year was around 428,000 as compared with about 420,000 in 1925, the 7 per cent increase in total truck output having been made possible largely by 14 per cent gain in export shipments. Yet despite this less than 2 per cent advance in production for domestic consumption, a number of individual truck makers recorded excellent increases for the year.

This is true of some of the lesser companies among the exclusive truck builders as well as of the light truck makers like Chevrolet, Dodge and Graham Bros., who, as is generally known, accounted for the major part of the numerical gain in truck output last year. A group of 10 rather typical exclusive truck producers whose individual volume, relatively speaking, is not large, gives a fairly good indication of this trend. This group, comprising Moreland, Republic, Pierce-Arrow, Selden, Sterling, Stewart, Commerce, American-La France, Acme and Diamond T, built nearly 9 per cent more trucks in 1926 than in 1925, while the increase for the industry as a whole was slightly less than 7 per cent.

Nearly All Made Gains

Not all of these companies made gains. Five, in fact, built less in 1926 than in 1925 and five built more, but the composite figure serves to indicate that a group of typical makers outside of the five or six largest exclusive truck producers was able to record material progress last year.

The larger of the exclusive truck builders as a group just about held their own last year in output as compared with 1925. The total production of Mack, White, International Harvester, Federal, G.M.C. and Autocar last year, for example, exceeded their 1925 total by a little less than $\frac{1}{2}$ of 1 per cent. Only two out of the group, as a matter of fact, showed any increase for the 12-month period. But in practically every case the groundwork was laid for sounder and more profitable activities during 1927.

While those truck company financial statements which are available for 1926 do not show anything startling in

the way of profits, they do indicate that many companies took occasion before the end of last year to get their houses in order, to write off losses which had been potential liabilities for some while back and to clear the decks for sound building in 1927, based upon strenuous attempts to adhere to conservative methods in retail financing and in trade-in practices.

Reports from various parts of the country indicate that in some respects the truck manufacturers are faced with more favorable conditions than are the car builders just at the present moment. In most areas, for example, it would appear that stocks of used trucks on hand are not any higher than they were at this time last year, while in a majority of places used truck sales are equal or slightly ahead of those for this time in 1926.

Definite Change in Attitude

But what is probably more important basically is the unanimity with which the reports indicate that a very definite change has taken place in the attitude toward retail financing terms and trade-in practices. Out on the Pacific Coast, according to advices received recently, the movement toward sounder financing and more conservative trade-ins hasn't made a whole lot of progress to date, but in practically every other section of the country, it is reported, the trade already has adopted and is carrying out in practice more rigid policies in regard to allowances on trade-ins and is demanding larger down payments and shorter terms on time payment sales than were common a year ago.

With the truck manufacturers in general concentrating on adherence to these sounder marketing policies, there has been a general tendency among truck executives to predict slightly smaller sales for 1927 than those recorded in the 1926 total. But as the quarter progresses prospects continue to brighten and there are those now who feel that last year's production record may be equalled in 1927 without unduly increasing used or new truck stocks. Only time will tell the whole story in this regard, of course, but January output figures on trucks indicate a favorable condition thus far. While passenger car output was dropping behind that of 1925 and 1926 in January, truck production went to 40,788 as compared with 32,637 in January of 1926 and 28,141 in January of 1925. In February the truck builders recorded an increase over January as well as a substantial gain over February of a year ago.

It is worth noting that these gains, while largest in the vehicles of $1\frac{1}{2}$ tons or less capacity, were well distributed through the other tonnage classes as well. The January production gain for trucks of greater than $1\frac{1}{2}$

tons capacity over January, 1926, was in excess of 12 per cent.

Ford truck production, so far as can be determined from data now available, has been less thus far than during the same period last year, although considerable gains are being piled up by several other light truck manufacturers.

It is too early to predict quantitatively what the outcome of the 1927 truck business will be. It can be said, however, that the results of the first few months of the year and analysis of last year's records indicates good business and sound progress in store for a majority of truck organizations.

White Has New Four-Cylinder 2-Ton Truck

MODEL 56, a 2-ton truck chassis intended for high-speed operation, is the latest development of The White Co., Cleveland, Ohio. The engine is a four-cylinder, L-head, mono-block type having 4 in. bore and $5\frac{3}{4}$ in. stroke. The cylinder head is removable and combustion chambers are machined.

A selective, four-speed transmission with direct drive in top speed and a single plate clutch running in oil are mounted integral with the engine. Three point suspension is employed. Pistons are of aluminum alloy and are of the constant clearance type. Connecting rods have direct babbitted bearings and are provided with drilled oil holes running through the rod.

Pressure lubrication is provided for all crankshaft, camshaft and connecting rod bearings. All return oil passes into a settling chamber before passing up into the oil reservoir through a screen. The timing and pumping gears are lubricated from an orifice set in the main delivery tube. The piston and cylinder walls are continuously lubricated through metered slots in the connecting rod bearings.

The intake manifold is fitted with an air cleaner, is cast integral with the exhaust manifold and is of the hot spot type. Cooling is provided by a gear-driven-centrifugal pump. The radiator is of cast aluminum with removable cellular core and is mounted on spherical seats.

The rear axle is of the single reduction type with axle spindles supported at the wheel ends by double taper rolling bearings. Reductions of 6.33 and 5.7 are optional.

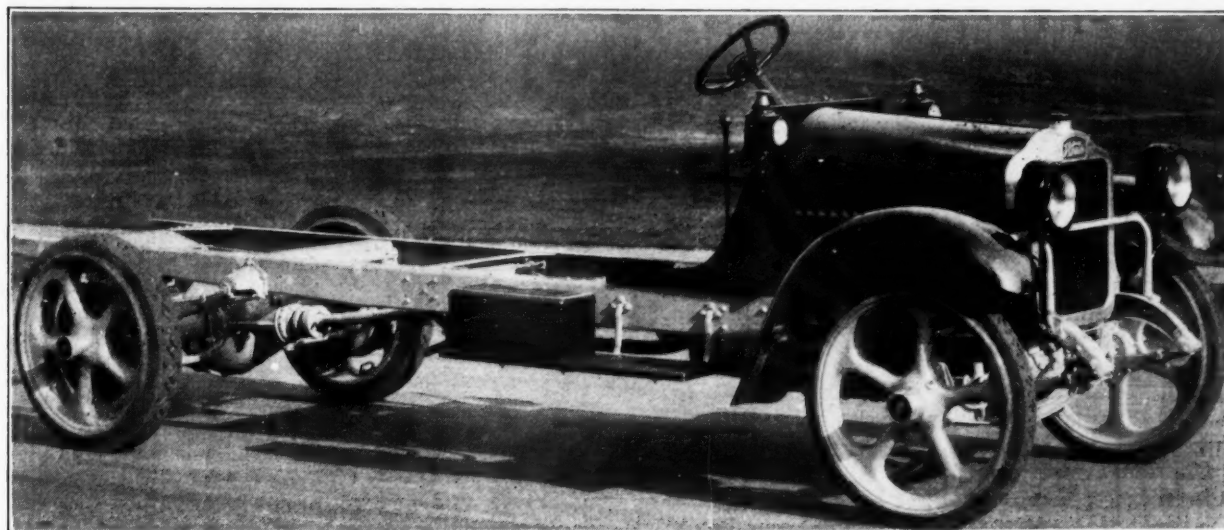
Rear wheel brakes are internal, two shoe-type. Emergency brake is of the single drum type supported by a self aligning ball bearing mounted in frame cross member. Wheelbase is 165 in.

FOR several years now the German automobile manufacturers' association, the Reichsverband der Automobilindustrie, has published a yearbook, and the third edition, for the business year 1925-26, has recently issued from the press, the editors being Dr.-Ing. Wilhelm Scholz, a director of the association, and Dr. Ernst Valentin. The introductory article by Dr. Scholz is a review of business conditions during the year covered.

It is stated that the industry during this period was affected by the lifting of the embargo on automobiles and parts on Sept. 30, 1925; the signing of the commercial treaty with Italy (of great importance because the tariff reductions granted to Italy in this treaty were automatically extended to all countries entitled to most favored nation treatment, including Belgium, Great Britain, Austria, Czechoslovakia and the United States); the signing of a provisional commercial treaty with France on Aug. 3, 1926; revision of automobile tax regulations by a provisional measure adopted on May 15, 1926; repeal of the luxury tax and a material reduction in the turnover tax; the terms of guarantees assumed by the Federal and State governments in connection with deliveries to Russia; the effects of the British coal strike which started early in May, 1926; the establishment of a committee of inquiry on the reasons for the fluctuations in German economic life, and the reorganization of German finances in accordance with the program of Finance Minister Reinhold.

A great deal of statistical data is given in this article, based upon the annual census of automobiles in Germany, on import and export returns, records of foreign cars brought into Germany temporarily, etc. This review also covers progress in automobile standardization in Germany during the past year.

A long article on "The Development of Taxicab Services" is contributed by Stanislaus M. Zentzytzki and one on "Special Vehicles" (dumping trucks, fire engines, garbage wagons, hook and ladder trucks, street sprinkling trucks) by Dipl.-Ing. P. Friedmann. The yearbook also contains articles on "Modern Methods of Road Construction," "Methods of Decreasing the Working Capital Required in Automobile Production," and the "Development of Motor Vehicle Hub Bearings."



New White Model 56 2-ton truck chassis



Automatic Lathe Coming to Front in Automotive Production

*This type of machine now used in many plants
and performs some unusual jobs. Labor
saved on long turning operations.*

WITHIN the past two or three years the automatic lathe has come into prominence in automotive plants, particularly for operations which are midway between those usually performed in the bar stock machine and the larger automatics designed for castings respectively. One thing that is bringing the automatic lathe into prominence is the fact that relatively long turning operations are carried on between centers; labor charges thus are reduced by reason of the division of one man's time between two or three machines.

One unusual operation which has been placed on an automatic lathe recently is the turning and facing of all outside diameters on Dodge differentials. As shown by Fig. 1, Fay automatic lathes, made by Jones & Lamson, are used for this job. Four machines are used, in two batteries of two each, for roughing and finishing operations respectively. The set-ups for both operations are very much alike. In fact, the roughing operation removes inequalities to insure finished accuracy. End bearings upon which the anti-friction bearings are pressed in assembly are turned to limits of .0015 in., and the ring gear pilot is turned to similar limits. The degree of accuracy for these diameters and the ring gear flange is such that no grinding is required after the finish-turning. The production from this group is in excess of 80 pieces per hour.

An entirely different application of the Fay automatic lathe is shown by Fig. 2. Here differential side gears,

after having been broached, are loaded, two at a time, on an arbor, one of which is shown at the right. Both ends of the hubs are faced also. The gears are $4\frac{3}{8}$ in. in diameter. The gears are finished to the final size in one cut. The back arm profiles the face angle and rough forms the extension hub at one end of each gear. An auxiliary facing attachment finish forms this hub and finish-faces both steps on the back of each gear. Carriage tools turn the opposite hubs on both gears while taper attachments, also on the carriage, profile the back angles. One operator runs two machines and produces 125 gears per hour.

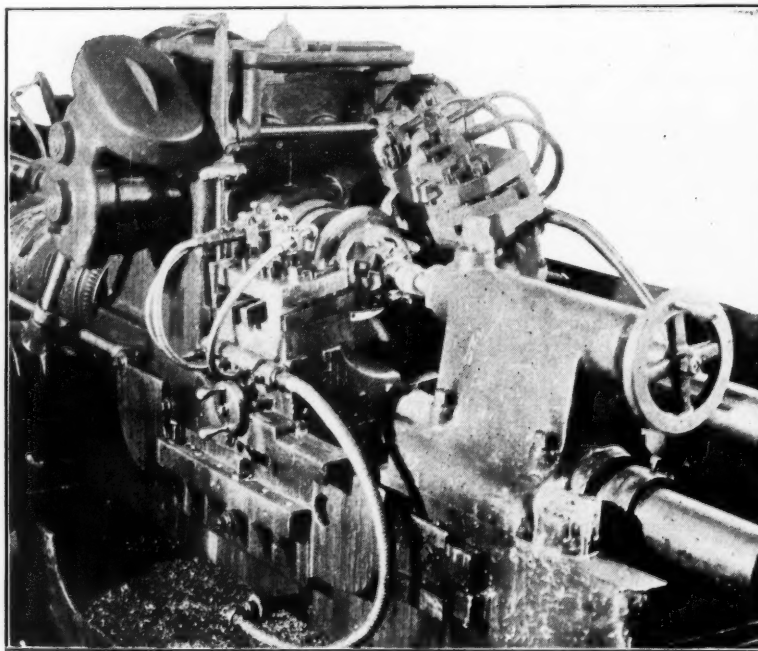


Fig. 1. Fay automatic lathes rough and finish all outside dimensions on differential carriers to close limits so that no grinding operation is required

Valve stem guides are turned at the rate of approximately 270 pieces per hour on the Pratt & Whitney automatic lathe, as shown in Fig. 3. A fountain feed, combined with the loading characteristics of the tailstock and an automatic driver at the headstock, makes constant attention by the operator unnecessary, so that these machines can be run in a battery.

When the valve guides are loaded into the fountain the holes in them are semi-finished and one end is taper turned. An automatic loader at the bottom of the fountain, which is synchronized with the

main control cam, delivers the guides to the centers, where loading is completed by the action of the tailstock. Guides are piloted on centers at both head and tailstock and driven by a floating unit which contains three cam-shaped drivers. After the barrels are turned, the guides are dropped into a pan at the base of the machine and

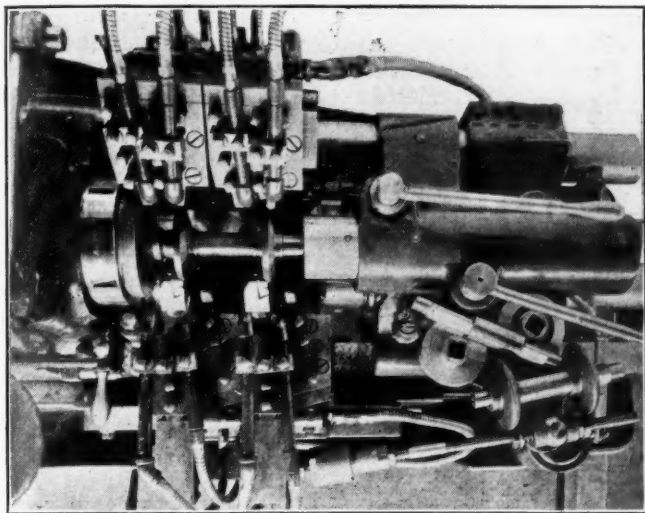


Fig. 2. Differential side gears are turned completely by one operator and two machines at the rate of 125 pieces per hour.

the cycle is repeated. A comparison of the parts arriving at and those leaving the machine is furnished by the pieces on the tailstock. The two standing up show the parts as they arrive at the fountain.

Fig. 4 illustrates a king bolt as it approaches and leaves a similar machine in which fountain feed is utilized. Here one end is turned for threading while the neck under the head is formed. Production on this piece is at the rate of 300 per hour.

Further indications of the adaptability of the automatic lathe are given by the next two examples which are applications of the Duomatic made by the Lodge & Shipley Machine Tool Co. In the first illustration, Fig. 5, all of the turning operations on a steering knuckle with brake support are performed by seven tools in an unusual grouping. The drop-forged steering knuckle is

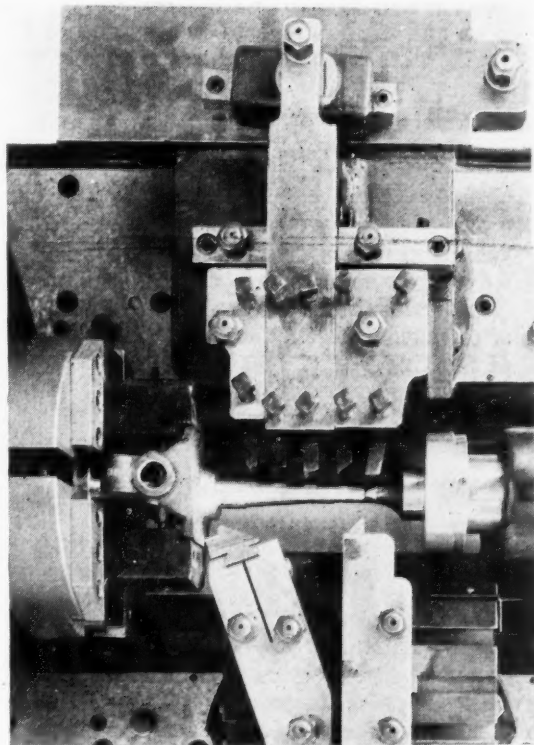


Fig. 5. Seven tools perform all turning and facing operations on four-wheel brake knuckle spindle.

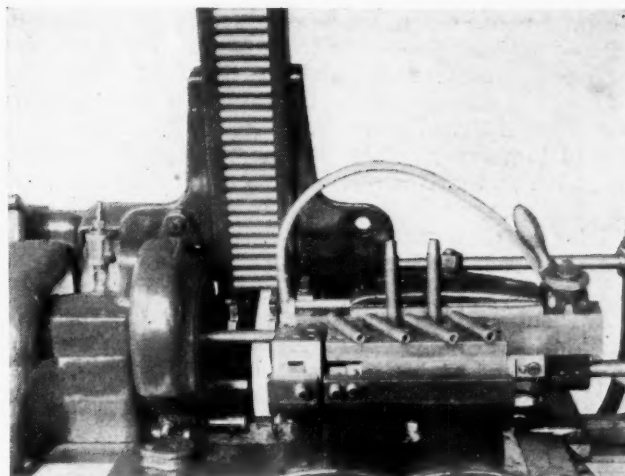


Fig. 3. Pratt & Whitney automatic lathe equipped with fountain feed for turning the outside of valve stem guides at the rate of about 270 pieces per hour.

centered before delivery to this machine. While mounted on the usual headstock center and ball bearing tailstock center, the drive is through a pair of equalized jaws which contact with the brake carrier flange.

The front carriage carries infeed tools, one of which is formed to produce the bolting face for the brake carrier as well as the shoulder between this face and the inner bearing. A second infeed tool on this carriage forms the chamfer at the outer end of the spindle in preparation for the subsequent threading operation. While the back carriage is traversed so that the tools mounted there turn the lands for the two bearings and the threaded portion at the outer end of the spindle,

Fig. 4. King bolts which are turned and necked in a similar machine at the rate of 300 pieces per hour. Dimensions show nature of cuts taken.

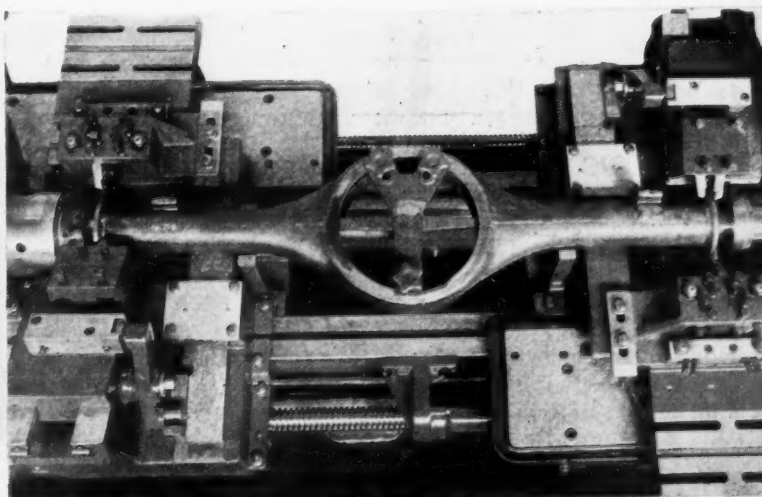


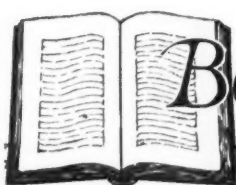
Fig. 6. Tooling at each end is reversed so that both flanges of pressed steel rear axle housing are rough and finished faced and turned in one set-up.

an interesting taper attachment also forms the tapered section between the two bearing lands. Two tools, each of which machines half the length of this taper, are mounted in a slide between the groups of tools for turning the cylindrical portions. This slide in turn is connected to a taper attachment on the lathe. Operation is cyclic, so that the operator merely loads and starts the machine, which is one of a battery. At the conclusion of the operation, the machine stops, with the tools cleared for reloading.

Fig. 6 shows an interesting example of duplication of equipment in the larger range of work handled by this machine. Both flanges of a pressed steel rear axle housing are faced on both sides and the outside diameters are turned simultaneously. Both rough and finish oper-

ations are completed in one set-up. Duplicate cutter slide assemblies are used by reversing the arrangement of the front and back of the machine. The finishing tools are interconnected so that they follow the roughing tools to the completion of the operation.

Saddles which receive the axle before centering are bolted to the bed of the machine. Loading is facilitated as the operator merely drops the axle into these saddles and then brings up the tailstock which carries a ball bearing center. As the cuts are relatively light, drive is accomplished at the headstock without the necessity of external driving jaws or similar means. As the axle is driven from the center, both flanges can be machined in one set-up. In this instance, also, operation is cyclic.



Books for the Business Bookshelf

German Engine Design

Theory and Practice of Automobile Engine Building. Curt Hanfland. Dieck & Co., Verlagsbuchhandlung, Stuttgart, Germany. 21 marks.

THOSE of our readers who understand German will get a good grasp of present tendencies in European and especially in German car engine design from this fundamental manual on automobile engine building that has recently appeared in Germany from the pen of Hanfland, a well-known German designer of automotive vehicles.

The Business of Aviation

Commercial Air Transport. Lieut.-Col. Ivo Edwards and F. Tymons. Sir Isaac Pitman & Sons, Ltd., New York. 163 pp. illus. \$2.50.

WITH the growing interest in this country in commercial air transportation, this book should be of considerable assistance to those now operating air transport lines or who contemplate undertaking such a venture. While based on Continental and British practice in which subsidies and state control play a larger part than they are likely to here, there is much valuable information culled from extensive experience overseas in air line operation.

Don't Fight!

How to Win an Argument. Richard C. Borden and Alvin C. Busse. Harper Brothers, New York. 166 pp. \$2.

CONCEDING the quite debatable point that in any argument of the usual character on politics, religion and such subjects the two parties to it ever agree as to its outcome, this book provides some very pertinent hints as to how to make this decision for the reader's side. The entire book is based upon six injunctions which, it is said, with apparent logic, will greatly promote successful argumentation.

These six principles are: Don't try to do all the talking yourself; don't interrupt your opponent; avoid an argumentative attitude that is belligerently positive; in the first part of the argument inquire rather than attack; restate in your own words your opponent's argument as soon as he advances it and identify your own argument with one key issue and stick to that issue.

Advertising as a Science

Advertising Research. Percival White. D. Appleton & Co., New York. 597 pp. \$6.

THIS book is an attempt to treat advertising as a science, to analyze its problems as a scientist would divide them rather than as an advertising man would. No attempt has been made to solve the major problem of creating advertising matter but all the other phases of the art have been covered in such a way that an imaginative mind, capable of the actual creation of advertising ideas, will be materially assisted in getting for those ideas the best possible treatment. Following this line, considerable attention has been given to the theoretical aspects of advertising although the practical side has not been neglected. Altogether, the book seems to be unique in its method of presentation and in the subjects treated and should prove of considerable interest and value to advertising men.

Petroleum Development

Petroleum Development and Technology in 1925. The American Institute of Mining and Metallurgical Engineers, New York. 784 pp. illus. \$5.

THIS book contains complete papers and discussions presented at the symposiums of the Petroleum Division of the Institute at the New York meeting, Feb. 15-17; the Los Angeles meeting, Jan. 21, 1926; and the Caspar, Wyo., meeting, Aug. 28-30, 1925.

The various papers cover the general subjects of production engineering, refining technology, transportation engineering, production and petroleum economics.

Collection of Employment Data

Employment Statistics for the United States. Edited by Ralph G. Hurlin and William A. Berridge. Russell Sage Foundation, New York. 215 pp. Charts. \$2.50.

THIS book contains a plan for the national collection of employment statistics and an outline of the methods to be used in collecting and tabulating them. It is the result of researches made by a committee of the American Statistical Association which started on the work after it was discovered, during the 1921 Conference on Unemployment, that accurate unemployment data for the country were not to be had.

"Outlook for Foreign Sales Never Better"

*So says John N. Willys in Foreign Trade Committee report
to N.A.C.C. Thinks 600,000 vehicles will be exported
this year. South American market improves.*

ON the whole, the outlook for foreign sales of automobiles was never better. There are, however, many things still undone which must be undertaken before we can achieve maximum results which the situation warrants."

This is the view expressed in a recent report made to the members of the National Automobile Chamber of Commerce by John N. Willys, chairman of the Foreign Trade Committee.

A study of conditions in the export field leads him to predict that sales of American motor vehicles in foreign markets this year will exceed 600,000, as compared with about 511,000 in 1926. (The latter figure includes both complete vehicles shipped from United States and Canada and vehicles assembled abroad from American-made parts.) He gives the following reasons for his belief that there will be a substantial increase in export business:

"Improving prices for primary products, coupled with large output are serving to stimulate motor vehicle sales in Argentina and other important countries which are taking the products of our industry in volume. The market in Argentina was retarded particularly during the past year due to chaotic conditions in the beef industry, the greatest export commodity of the country, and unsatisfactory prices as well as low yields in the major crops grown there.

"Coupled with these adverse factors, there came a number of major commercial failures, all destructive of confidence and exerting deadening efforts on general business. The fact that the automobile business was affected to a lesser degree than others was both surprising and gratifying, as was also the substantial increase in motor vehicle shipments to China despite civil strife continually going on there.

Awakening in Colombia

"Another gratifying development was the awakening of the people of Colombia to the necessity for developing motor transport to supplement transport afforded by the Magdalena River, particularly at times similar to those recently experienced there when the low level of the river seriously retarded the commerce of the country. Recent word from that country indicates that dealers have been having difficulty in obtaining cars fast enough to meet the abnormal demand.

"European business should increase during the coming year due to further perfection of merchandising systems by our leading automobile exporters, and also by the appreciation of exchanges in automobile manufacturing countries which gained a temporary competi-

tive price advantage in many markets where their depreciated currency made their cars so much cheaper in terms of the money of the country in question, whether effected by this price competition or not. Appreciation of exchanges in both manufacturing and non-manufacturing countries favors increased sales, as prices of American vehicles in terms of the money of these countries are thereby lowered.

Conditions in England Better

"Cessation of the British coal strike has been followed by constant economic and industrial improvement in that important market and should also promote better trade prospects in the balance of the British Empire as well as in other countries economically interrelated with Great Britain.

"During the past year, a great forward step has been taken by the Chamber, by all of you cooperatively, through sending representatives to Cuba, Canada, New Zealand, Australia, the Straits Settlements, India, Egypt, East and South Africa as well as 16 countries of Europe to meet with motor groups there and give them our experience on highway construction and maintenance, taxation, regulation, legislation, safety and traffic planning, merchandising, financing, servicing and related topics. They are now confronted with problems in these matters which were solved in this country after long and expensive experiments. Your representatives have told of solutions already found here for the problems with the thought that they may benefit by our experience along these lines.

"To further this work, your Chamber took a leading part as host to the Pan-American journalists who were here last May. The favorable reaction engendered by this visit as evidenced in subsequent news items and editorials appearing in the Latin American press has clearly demonstrated its value in fostering better relations with our sister republics to the south.

"Great as has been the good done by this cooperative action by our manufacturers, there are still numerous ways in which, as individuals, they can do much to extend their business abroad. Chief among these factors on which a great deal remains to be done is the reduction of delivered cost of vehicles laid down in foreign markets. Each of us, both as individuals and cooperatively as members of the Chamber, must bend every effort toward more economical shipping practice in order that costs of vehicles laid down in customs warehouses abroad may be brought more nearly in line with those incident to deliveries made in our own domestic market."

NEW DEVELOPMENTS—Automotive

Natco Multiple Spindle Drill

A NEW multiple-spindle drill for drilling such automotive parts as transmission cases, differential cases, axle housings, cylinder blocks and small crankcases has been developed by the National Automatic Tool Co., Richmond, Ind. The machine is capable of drilling numerous holes at opposite sides or ends of a casting simultaneously, and it embodies the principles of hydraulic feed (moving the two drill heads toward the work-holding fixture by oil pressure) and of a rotating, indexing work fixture, which is loaded and unloaded in one station while in the other station the drilling operation is taking place.

A Heald pump is used for moving the oil, while the control mechanism is of the National company's own design. By turning a knob the rate of feed can be varied from nothing to 15 ft. per minute. The machine has a fast forward feed and a quick return, and the changes from one to the other are automatic. Feeds are controlled by adjustable trip dogs. When the work is changed all that is necessary to adapt the machine to the new operation is to change the cluster boxes. The operator unloads and loads while the machine is in operation.

The left-hand head is operated by a 3 hp. and the right by a 5 hp. motor. There is a third motor of 3 hp. for driving the Heald pump which develops a maximum pressure of 200 lbs. p. sq. in. The cluster boxes are entirely enclosed and run in an oil bath.

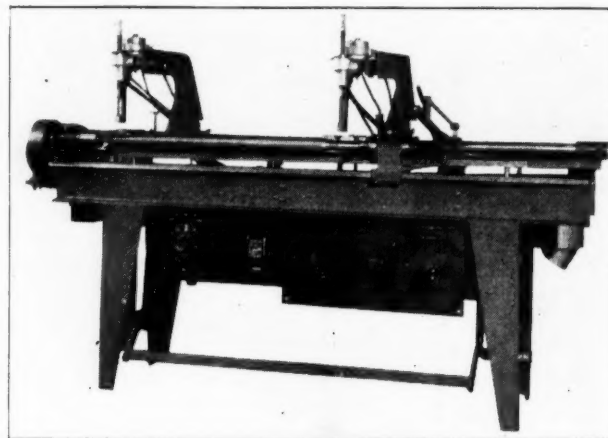
The hydraulic cylinders which operate the heads are 6 in. in diameter and have a 12-in. stroke. By means of the Natco semi-automatic control the length of feed and rapid traverse can be readily adjusted. The machine is started by pulling out the knob shown under the fixture. After the complete cycle of operations has been performed the heads come to rest at the outward ends of the strokes. In case of an emergency the heads can be quickly withdrawn by pushing down on the small han-

dles shown at the left and the right of the starting button.

In the illustration the machine is shown tooled up for drilling the top and bottom holes of the cylinder of a refrigerating machine. For this particular job four machines were furnished, two for drilling ten $\frac{1}{4}$ in. holes with the right-hand head and five $\frac{3}{8}$ in. holes with the left-hand head in the crankcases, and two for drilling ten $\frac{11}{32}$ in. holes with the right-hand head and eight $\frac{1}{4}$ in. holes with the left-hand head in the cylinders.

The maximum drill size for this machine is from $\frac{3}{4}$ to 1 in., depending upon the character of the material, and the production is about 150 pieces per hour. This same machine is made in a slightly different form to drill in either three or four directions at the same time.

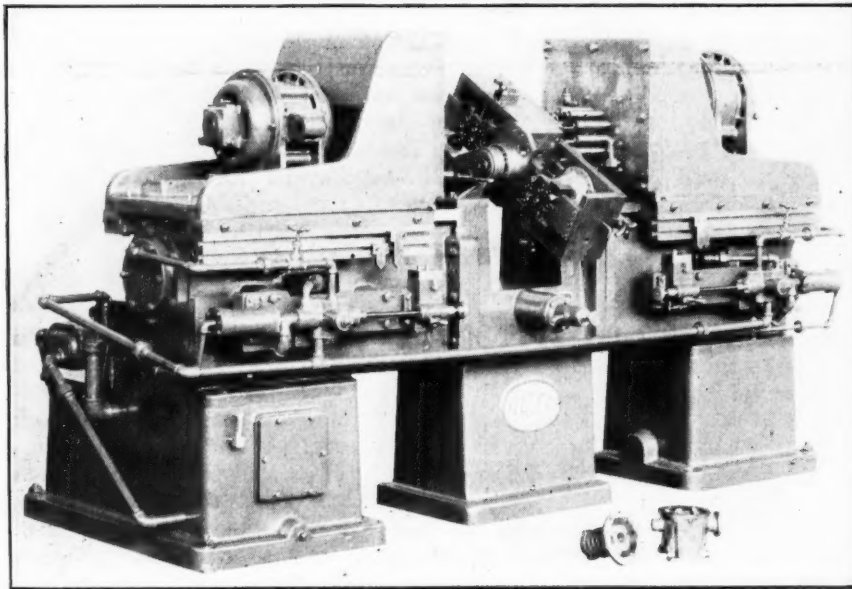
Carbon Arc Type Butt Welder



Lincoln carbon-arc butt welder

DURING the last 12 months several welding machines have appeared on the market which accomplish automatically work that was formerly done by hand. One of these, the Lincoln butt-welding machine made by the Lincoln Electric Co., Cleveland, Ohio, is illustrated herewith. This machine represents a further development of the machine-driven carbon arc in welding. One ordinarily thinks of butt-welding as resistance welding, but it is claimed that the carbon arc type of butt welder lends itself to the solution of problems which cannot be solved with the resistance welder.

An example of the class of work referred to is furnished by the case of a plug to be welded into the end of a tube. This is readily accomplished with the arc butt welder but cannot be done with the resistance welder, it is claimed. The machine illustrated welds both ends of the tube at once by the use of the two automatic heads. A similar instance of applicability of the arc butt welder is that of welding a small



Natco hydraulic duplex multi-spindle drill

Parts, Accessories and Production Tools

diameter round bar to a large diameter bar. With the arc butt welder, the welding heat is applied to the joint by the carbon arc and the bars are revolved to distribute the heat uniformly. Pressure is applied to squeeze out the slag and complete fusion.

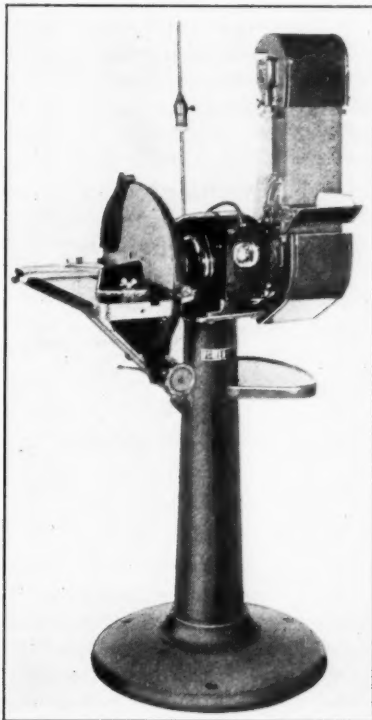
Use of the arc butt welder involves no difficulties with the power supply. The motor generator set used to supply current for the arc comprises a standard induction motor and supplies direct current at 40 to 60 volts.

Combination Grinder

THE Porter-Cable Machine Co., Syracuse, N. Y., has designed a combination belt and disk grinder and sander which does both rough and finish grinding and permits both kinds of work to be carried on simultaneously if desired. The disk side of the machine has a large table which tilts up and down through a range of 55 deg. and it may also be removed in order to use the entire face of the disk. An angle gage and a core print gage operating in a slot in this table makes it possible to secure compound angles and also a variety of curves. A patented vacuum dust-collecting system is built into this machine. This consists mainly of fans at the back of the disk which produce a vacuum in the housing, thus drawing down the dust and forcing it through the pedestal to the floor.

A $\frac{3}{4}$ hp. ball bearing motor furnishes the power to operate both the disk and the belt. The belt is driven by a $7\frac{1}{2}$ in. pulley and runs over an idler 4 in. in diameter at the top of the machine. The belt side also has a table and angle gage which may be readily removed and tilted up and down. One advantage of the belt is that when the table and upper dust gage is removed, pieces 18 in. in length or longer may be uniformly sanded by moving them back and forth along the belt. Work of this size cannot be successfully handled on small disk sanders.

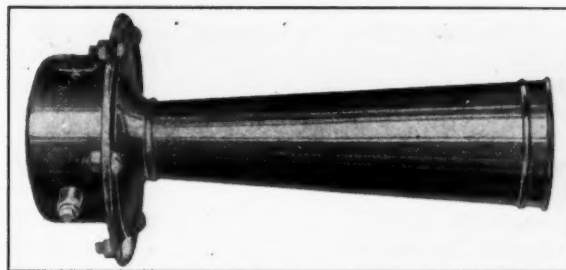
The bed under the belt may be placed in either a horizontal or vertical position by removing four cap screws which allows it to be moved through an arc of 90 deg. This enlarges its capacity and makes it more convenient for certain operations and really provides three machines in one. Ball bearing construction is used throughout. The overall dimensions are 60 x 30 x 20 in.



Type BD-1 combination
belt and disk sander and
grinder

New Northeaster Horns

THE North East Electric Co. has announced a new model horn to be known as the Northeaster "75." The new horn is for use on all makes of cars, including buses. It is large and has an unusually powerful tone.

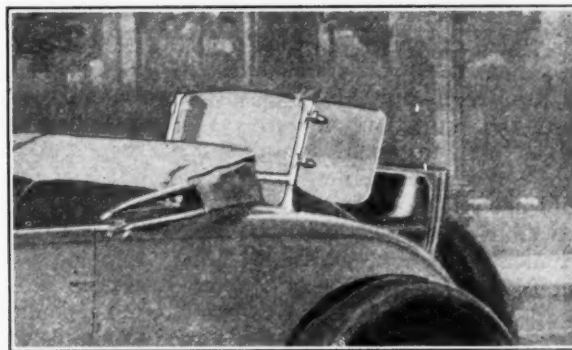


The new Northeaster "75" horn for all classes of
passenger cars and buses

Another new model known as the Northeaster "50" also is announced. This horn is constructed on the same general lines as the original standard Northeaster. It is lower-priced than the "75."

Rumble Seat Windshield

A RUMBLE seat windshield which folds into the rear seat compartment when this seat is not used has been developed and is being placed on the market by the American Injector Co. of Detroit. The windshield, which is provided with wings and an apron at the bottom and sides, attaches directly to the upper cross member at the front of the rumble seat opening. When not in use the glass folds down onto the seat, no part of the mounting being visible. When in use it can be tilted at any angle desired.



The American disappearing rumble seat windshield
developed by the American Injector Co.

THE Daimler Motor Co. of Coventry, England, recently shipped from Manchester to Hamburg a motor bus of the type in use in London. From Hamburg the bus was to be driven under its own power to Budapest, stopping en route in all the larger cities of Germany and Austria. The object of the trip was to interest municipalities in the type of bus presented. A Tillin-Stevens bus later was sent on the same journey.

Stabilized Buying Will Benefit Machine Tool Industry

Hand-to-mouth purchasing policy of other industries will result in a more even flow of business to the makers of factory equipment and will eliminate some present evils.

By Ernest F. DuBrul *

General Manager, National Machine Tool Builders' Association

THE equipment industries of the country are in a distinctly different position than that of any industry making consumer goods. In a broad sense the equipment people always have had a hand-to-mouth business, and they probably will continue to have it. It is a rare bird indeed who buys machinery or erects a plant and lays it away on ice against a future day.

I wonder how many men can be induced to buy machinery on the sole argument that the time to buy is when costs are low and builders can make prompt deliveries and are willing to sacrifice profits to hold an organization together.

Generally that argument will not coax a teaspoonful of business out of a man whose plant is not running up to capacity. Nearly all manufacturers buy machinery only if and when they think they are going to be able to use it rather promptly in producing goods at a profit. If that happens to be when business is dull in the equipment industries, a shrewd buyer can perhaps pick up some equipment bargains. But he is not buying because of low prices, but because of actual need of the machinery.

No class of industry can be helped more than the equipment industries by stabilization of general buying. Industrial machines cannot safely be stocked in dull times, because any competitor may come out with a new and revolutionary design that simply turns all stocks of previous designs into scrap. So these industries have always had to go through the painful, wasteful and costly process of curtailing their labor forces when their demand fell off.

The recent comparative stabilization of consumer goods buying has had some very marked effects on the machine tool industry. Instead of a fairly high boom following the big slump of 1921 and early 1922, the year 1923 brought only a very little boomlet that did not reach much if any above 45 to 50 per cent of the

HAND-TO-MOUTH buying has become an important factor in the automotive manufacturing and industrial field as well as in the relations between the manufacturer and his wholesalers and retailers. Automobile factory managers have succeeded in increasing materially their inventory turnover in recent years and 1927 is witnessing further strenuous efforts along this line.

The same principles are being analyzed in connection with the buying of machine tools and other factory equipment by automotive manufacturers. The accompanying article treats particularly of this latter phase of the hand-to-mouth buying problem and holds vital elements of interest for the automotive manufacturing executive.

industry's capacity as a whole. Then what was only a slight recession in 1924 for other industries was a fairish slump in the machine tool field. 1925 and 1926 pushed the industry's orders above the boomlet of 1923, making an average utilization of plant probably around 60 or 65 per cent of one-shift capacity. Since the present capacity is the result of a heavy war-time expansion, that would be a rather good pre-war business. But overburdened with this extra capacity that it must carry for some years more, the industry as a whole has not been a happy hunting ground in which to get anything like the bag of profits that other

industries have furnished during the last few years.

Curiously enough, some users have come to refuse to buy machines that do not pay 100 per cent or more per year on the investment. Recently one of this class refused to install a battery that would pay only 50 per cent a year. As the machines were not to be got anywhere else, the president of that user company is depriving his stockholders of a chance to earn money by investing a part of their surplus, which he is kindly holding for them in gilt-edge bonds that pay about 4¾ per cent. That particular company's factories are full of obsolete machines that should properly be shown on the books as a liability instead of an asset. Its president, however, wonders how a competing concern can possibly show the earnings it reports, but then the competitor's president bought a large number of the 50 per cent a year dividend-paying machines, which the other men think are too high priced.

Recent surveys of equipment in machine shops of all sorts have disclosed to us a large number of machine tools that are more than 10 years old. Many of these tools are in good running condition, because to do good work when new they had to be so well built that wear out is extremely slow. But physical life and economic life are two quite different and unrelated kinds of life.

*From a paper read before the Hand-to-Mouth Buying Conference held in Chicago under auspices of the Metropolitan Life Insurance Co., in February.

Necessity to get business has again borne a fresh crop of new inventions and development in the machine tool industry. So many superior designs have been brought out in the last five years that mechanical experts agree that nearly every type of machine tool built up to 1921 is now definitely obsolete for fast production. As wideawake users install the newer types, their less wideawake competitors must either follow suit or sink into business oblivion.

Beginning to Share in Prosperity

On this fact basis, the machine tool industry has stepped out of the mire, and while its profits have not been great, due to the burden of excess capacity, it at least has begun to share a little in the general prosperity that its designs have created for its customers. Relatively stable buying of machines will help us more than anything else we know of. But this can be gained by us only after our customers' demand has been stabilized, so we are very glad to do everything possible to urge business men in all other industries to study this problem and learn how to help cure the evils of unnecessary irregularity that have cursed all business in the past.

After a yachtsman has acquired a good pair of sea legs that keep him on his feet on a tossing boat, he finds some trouble in readjusting his gait when he steps onto a solid concrete dock. He may stagger about so badly that a prim member of the W.C.T.U. would swear in court that the yacht had picked up a contraband liquid cargo somewhere. So I imagine that some perfectly sober business houses have been staggering a bit in somewhat the same way, training very skillful sea legs to walk without staggering on a business gang plank that is considerably more stable than it used to be. There is some difficulty in readjusting the business mind to the feel of more stable demand.

No doubt you have heard some men complain that business in the last few years has not been what it ought to be. Then they got to deluding themselves into the idea that business was normal when they had such a spurt of orders as to cause the plant to run at the peak load. Under this delusion they shut their eyes to the cold fact that often the peak load was off, when much of the plant was idle. If they had taken the trouble to figure it out they would have found a surprisingly small average utilization. U. S. Steel's experience was about 60 per cent average production relative to capacity, over a period of many years. As nearly as I can figure, the merchant iron furnace average has been about 50 per cent under the old feast-and-famine condition. But a spurt is of course very exciting, with extra shifts, overtime, etc., and the monotony of going along steadily at 65 or 70 per cent makes life quite dull compared to the excitement of a spurt. But it really is more profitable in the end.

Stability Increases Profits

Perhaps the relative stability of operation, for some years past, even though it was below peak capacity, may account to a considerable degree for the curious paradox of the lower prices and greater corporation surpluses that we have witnessed in that period.

In time, as conscious study of the problem results in greater stabilization, the unnecessary and less efficient plants and managers in each industry will be squeezed out. The surviving units will be those that equipped themselves with the best plant and personnel, and are therefore able to meet sound, healthy

competition of similarly equipped and manned institutions.

It is well known that, given good statistics, the business analyst can point out many things done by business men in the mass that produce evil effects. So business men generally should pay more careful attention to statistics, to their own pocketbook benefit.

They should favor and procure prompt and accurate reporting by business houses to their trade associations. They should procure prompt and accurate compilation by qualified people in the various association offices. They should procure prompt and wide publicity of facts so gathered and compiled. They should give generous support to qualified interpreters of these facts. And finally, business men generally should learn how to apply those facts to their own individual businesses.

Normal and Abnormal Steels

CASE-HARDENING or carburizing is somewhat complicated, and a good many difficulties arise. One of the most serious is soft spots. Recent work by a metallurgist of a roller bearing company indicated that a type of steel which he called "abnormal," is more prone to give this trouble than another which he called "normal." The difference between the two types of steel is revealed by microscopic examination.

The conclusion that the kind of steel used may be responsible for soft spots was at first not accepted by all metallurgists. However, the Bureau of Standards, Department of Commerce, has studied the problem and shown that the two types of steel really exist, and the abnormal steel is more prone to give soft spots. Aside from the tendency to give soft spots, however, the abnormal type is not inferior to the normal and in some ways may even be superior. It was shown that by somewhat more drastic quenching it is possible to harden satisfactorily both types of steel. Incidentally, it was brought out that air dissolved in the quenching water has a detrimental effect. The origin of normality and abnormality was found to lie in the deoxidation treatment during the refining of the steel. Additions of aluminum in the ingot molds caused abnormality.

Coordinated Transport

(Continued from page 436)

efficiency. They are keen for anything that makes for better earnings and a more satisfied public." Their regard for earnings occasionally, at least, has seemed to be slightly warmer than for the public.

Moreover the inadvisability of bus manufacturers leaving entirely to the rail carriers the promotion of maximum economic use of buses, as contended in our previous discussion, is simply emphasized further by the clear statement of Aera that "the electric railways are definite in their conclusion that the bus has not proved and is not likely to prove its superiority over the street car for service in large and medium sized communities." This would indicate that, so far as the electric railway interests are concerned, the votes are all in and counted. We feel that the bus makers may much better participate actively in the study and propagation of the results of studies of transport problems than rest their case solely on the decisions of the rail carriers.

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania

Saturday, March 19, 1927

Continued High Retail Sales Speed Factory Production

PHILADELPHIA, March 19—Automobile business this month, aided by fine weather in most parts of the country, is better than most persons in the industry earlier in the year expected it would be. A large proportion of the factories have swung into capacity production, the outstanding exception being Ford, which is marking time pending the introduction of changed models.

Although the output total for the industry is thus adversely affected, for the companies exclusive of Ford business is well above the level of a year ago. Territorial influences are seen, and southern sales are not as satisfactory as in other parts of the country.

The slowing up in the South has increased delinquencies and repossessions in time-sales transactions, but not to a serious extent. For the national financing companies, in fact, the average of payment on time is at the highest point for the season in recent years. The winter months normally see a slight percentage rise in repossessions but this year except in the South the increase has been less. On the whole, the manner in which southern buyers are paying for their cars and new purchasers are coming into the market has been the subject of considerable gratification.

Automotive Industries' index of automotive raw material prices stands at 126 as against 138 a year ago, a drop of 9.4 per cent. Most of the decline, however, has taken place in the last two months and is a clear indication of a better cost situation for the producers. While raw material costs are not the largest item in construction cost, a few dollars per car means a great deal in these days of narrow profit margins.

Citroen to Buy American Tools for Plant Expansion

NEW YORK, March 16—Machine tools and automotive machinery of American manufacture will be bought in large quantities for Citroen Motors, according to F. Schwab, managing director of the Citroen company, who arrived in this country this week. Mr. Schwab will be assisted in the purchase of this equipment by a staff of Citroen engineers who are accompanying him. Purchases will range as high as several million dollars.

The machinery will make possible plant expansion.

Gorrell Operated on

INDIANAPOLIS, March 17—E. S. Gorrell, vice-president of the Stutz Motor Car Company of America, Inc., who underwent an operation for appendicitis on Monday, is reported to be making favorable progress.

Iron and Steel Rail Rate Hearing Starts

Carriers Believed Considering
Mileage as Rate Basis—
Shippers Object

PITTSBURGH, March 16—Shippers and carriers indulged in a skirmish here today with the shippers on the offensive but neither side getting any place in particular during the first hearing before the Interstate Commerce Commission in the investigation of iron and steel rail rates under the Interstate Commerce Commission docket No. 17,000, part six, in the Chamber of Commerce. Commissioner Johnston B. Campbell presided. With the commissioner were H. C. Faul, senior examiner of the commissioner's office, and C. M. Bardwell, senior examiner on the chief examiner's staff.

The Public Utilities Commission of Ohio and that of Michigan, together with the New York Public Service Commission were represented. A group of 400 representatives from the official classified territory attended.

All witnesses of the carriers were called and every one was subjected to close cross-examination by counsel for the shippers, who sought to learn the carriers' attitude concerning a change in the present rate construction.

Opposes Mileage Basis

F. P. Kinney, New Haven, declared he was opposed to putting iron and steel rates on a mileage basis and stated there is not an added 10 miles for movements through Philadelphia or New York, as Robert M. Collier, New York, chairman of the Trunk Lines Association, said was the case in his organization. Mr. Collier would not comment on mileage as a rate basis.

Although there is no indication yet that mileage is being considered as a rate basis by the carriers, counsel for the shippers so strenuously objected to such a move that it was rumored that in rebuttals in later hearings this matter would be a prime factor. The shippers will be heard tomorrow.

New Ford Four to Replace Model T

DETROIT, March 17—The Ford Motor Co. is proceeding with plans to introduce a new four-cylinder car soon to replace the present Model T, according to information from reliable sources. It is understood that many mechanical refinements will feature the new products and that a sliding gear type of transmission will replace the planetary transmission.

Ford is also said to be working out plans to replace the flywheel type of magneto ignition with the more modern distributor ignition system. It is also said that an oil and water pump will be included as part of the new powerplant.

Many changes in body lines, tending to give the cars a lower and more graceful appearance, are also contemplated.

German Duty Ruling Affects U. S. Firms

NEW YORK, March 17—Advices from Berlin, Germany, indicate that the German customs department ruling whereby certain automobile parts, heretofore imported into Germany under a low tariff for assembling, must hereafter pay the same high rate as finished machinery, has given American automobile interests a deal of concern. The ruling is retroactive to Jan. 1, 1927, since which date large numbers of parts affected have been received in Germany for assembling. The ruling will be protested.

American commercial men in Berlin fear enforcement of the ruling may result in abandonment of the assembling plants maintained in Berlin by two American firms manufacturing low-priced cars, hold up work on a similar plant which has been started by another American concern, and discourage other manufacturers from erecting assembling plants.

Under the new ruling the duty rate varies from 160 to 175 marks per hundred kilograms, compared with the former 3 to 12 marks. In the case of the cheapest cars this would mean an increase of from 8 to 10 per cent in the retail price.

Peerless Net Profit is \$919,883 in 1926

Big Increase Over \$126,804 in
1925—Assets to Liabilities
Ratio Now 11 to 1

CLEVELAND, March 16—Increase in the ratio of current assets to current liabilities from 4 to 1 in 1925 to 11 to 1 in 1926, is reported in the annual statement of the Peerless Motor Car Corp. and its subsidiaries, submitted to the board of directors today by Edward Ver Linden, president and general manager.

Current assets as of Dec. 31, 1926, were \$5,994,138.07, an increase of \$1,699,922.90. Current liabilities were \$546,838.14, a reduction of \$574,515.39.

In his letter to the stockholders accompanying the statement, Mr. Ver Linden mentions that the increase in assets includes \$600,000 paid in by him during the year for 30,000 shares of capital stock, purchased in accordance with the agreement made at the time of his affiliation with the company.

Cash and government securities amounted to \$2,097,909.48, an increase of \$1,519,537.51.

Net profit from operations amounted to \$919,883.70, or \$3.55 per share. This compares with a 1925 net profit of \$126,804.05, or 55 cents a share. The 1926 amount represents the net profit after charges of \$195,776.85 for tools, dies and fixtures for current models of cars, including development expense of the Model 90, brought out during the year, and Model 60, now in production.

Net Sales \$19,301,301

Net sales reached a total of \$19,301,301.72, an increase of \$1,948,761.78 over 1925.

Charges against surplus account for items not related to operations aggregated \$438,465.98.

Mr. Ver Linden reports that the organization of distributors and dealers has improved in quality and numbers. He announces, also, an improvement and increase in plant facilities in anticipation of an enlargement of the corporation's selling field through the introduction of the new Model 60, which will sell at a list price ranging from \$1295 to \$1345.

Hayes Buys Parker Wheel Patent Rights

DETROIT, March 14—The Hayes Wheel Company has purchased the passenger car manufacturing rights to the O. A. Parker patents covering a wheel which features a drop center rim, it was made known today, by an executive of the Hayes organization.

Murray-Briggs Deal Off

DETROIT, March 16—The proposed merger of the Murray Corp. of America with the Briggs Mfg. Co. has

been abandoned. Majority stockholders in the Murray corporation have been released from options which were obtained several weeks ago when it was contemplated to consolidate the two body manufacturers.

The Ford Motor Co. is reported to have opposed the merger on the grounds that it would reduce competition in the body field and make the Ford company too dependent upon the will of remaining body manufacturers.

Talk Tire Advance

Akron Makers Predict Increase
—Cite Raw Material Cost

AKRON, March 17—Following a year of frequent price cuts, which swept tire prices to the lowest levels in history, indications now are that the downward trend soon will be reversed.

Leading Akron authorities in the industry say that tire price increases are about due, in their opinion, in view of the rising tendency in cost of basic raw materials and the heavy demand developing for tires. While hesitating to state when an advance will be made, they expect it in the not distant future.

Cost of both crude rubber and cotton, the principal raw materials in tire manufacturing, has gone up substantially since the last price decrease.

"While there is not likely to be any sharp price advance, I think a moderate increase in the near future should be put into effect," commented William O'Neil, president of the General Tire & Rubber Co. "Tires are cheaper per mile than they have ever been, and the margin of profit is extremely close."

President P. W. Litchfield, of the Goodyear Tire & Rubber Co., predicting higher tire prices, said, "Good tires cost money, and they will advance in price to meet market conditions."

Federal-Mogul Takes Over U. S. Bearings

DETROIT, March 17—The Federal-Mogul Corp. announces that it has taken over the stock, trademark and good will of the U. S. Bearings Co., of Indianapolis, and that after April 1 it will handle the latter concern's products from the factory here.

In a circular letter to the trade, Federal-Mogul declares: "We desire to continue serving you with U. S. branch bearings while the present stock lasts, substituting Federal-Mogul brand as the other stock exhausts."

Velie Increases Prices

MOLINE, ILL., March 16—Velie Motors Corp. has made a price increase in the case of three body models. The Standard 50 three-passenger coupe and five-passenger sedan, formerly priced at \$1045, are now \$1165, and the Special 60 five-passenger royal sedan, formerly \$1,585, is now \$1,635.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, March 17—Further moderate expansion was noted in trade volumes last week, although the general level of activity apparently remained below that of a year ago. Commodity prices turned downward again, while stock quotations continued to advance, the gain being chiefly in prices of railway shares. Money rates remained at the level of the preceding week. General industrial activity last month, as computed on the basis of electric power consumption, was 12.7 per cent higher than in January but about 6 per cent below that of February last year.

PETROLEUM OUTPUT

A sharp decline in crude petroleum production occurred during the week ended March 5, when the average daily output was 2,464,050 barrels. This compares with 2,486,350 barrels a week earlier.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended March 9 were 16.9 per cent below the total for the preceding week and 3.6 per cent below that for the corresponding period last year.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 141.4 last week, as against 142.1 a week earlier and 144.4 four weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined \$47,100,000 during the week ended March 9, with decreases of \$18,700,000 in discounts, \$24,300,000 in open market purchases and \$4,000,000 in holdings of Government securities. Note circulation increased \$1,900,000 and reserves \$29,400,000, while deposits declined \$28,800,000. The reserve ratio rose from 78.5 to 79.7 per cent.

During the same period, loans of reporting member banks declined \$16,000,000, a decrease of \$58,000,000 in loans secured by stocks and bonds being only partly offset by gains of \$11,000,000 in loans secured by Government obligations and \$31,000,000 in "all other" loans. Investments increased \$6,000,000, while borrowings from the Federal Reserve banks declined \$13,000,000 and net demand deposits \$43,000,000.

CALL LOAN RATE

The call loan rate remained fixed last week at 4 per cent, which compares with a range of 4 to 4½ per cent a week earlier. Time loan and commercial paper rates were unchanged at 4½ to 4¾ per cent and 4 to 4¾ per cent respectively.

G. M. Retail Sales in February 102,025

Same Month in 1926 Bettered
by 37,054—Complete Line
Includes 72 Models

NEW YORK, March 14—Retail sales of General Motors Corp. cars for February totaled 102,025 as against 64,971 in February, 1926, according to A. P. Sloan, Jr., president. Sales by division to dealers in February totaled 124,426, compared with 91,313 in February, 1926.

Sales for the first two months of the year, compared with 1926 and 1925, follow:

	Dealers Sales to Users		
	1927	1926	1925
Jan.	81,010	53,698	25,593
Feb.	102,025	64,971	39,579
March		106,051	70,594

	Divisions Sales to Dealers		
	1927	1926	1925
Jan.	99,367	76,332	30,642
Feb.	124,426	91,313	49,146
March		113,341	75,527

With the introduction of the new LaSalle line, the complete General Motors line now includes 72 models with a price range at the factories as follows:

Chevrolet ..	7 models from \$ 525 to \$ 745
Pontiac ...	6 " " " 775 " 975
Oldsmobile..	11 " " " 875 " 1190
Oakland ...	7 " " " 1025 " 1295
Buick	18 " " " 1195 " 1995
LaSalle ...	6 " " " 2495 " 2685
Cadillac ...	17 " " " 2995 " 4350

17 Makers Take Part in Electric Truck Show

NEW YORK, March 17—Exhibitors at the electric truck show staged this week at the Irving Place show room of the New York Edison Co., included five truck manufacturers, four battery manufacturers and eight manufacturers of accessories. The truck makers were Commercial Truck Co., O. B. Electric Truck, Inc., Walker Vehicle Co., Ward Motor Vehicle Co. and Automotive Standards, Inc.

A feature of the show was the display of numerous charts showing the comparative cost of electric truck operation, different classes of truck users, garage and storage space saved, and other interesting sales literature.

LeRoi Acquires Beaver

MILWAUKEE, March 12—The LeRoi Co. has taken over the plant and business of the Beaver Mfg. Co., following the death of its founder, Thomas J. Neacy, several weeks ago. To accommodate the acquisition, the LeRoi Co. has placed contracts for the erection of a new shop, 175 x 360 ft., at its plant in West Allis, and will move the Beaver machinery and equipment to this extension upon its completion. Meanwhile production is being continued in the Beaver plant.

BUICK SEEKS CHECK ON WISCONSIN TAX

MILWAUKEE, March 12—The Buick Motor Co. of Milwaukee has filed suit in Federal Court here to prevent the City of Milwaukee from collecting \$226,000 taxes levied against the alleged income of the concern over a period of eight years under the Wisconsin state income tax law. Exemption from the tax is claimed by Buick on the ground that it is a branch of a Michigan corporation. The City of Milwaukee is made defendant because it acts as the collector of state income taxes in its municipal jurisdiction.

Says Public Seeks New Developments

CHICAGO, March 11—Speaking before the March meeting of the Chicago Section of the Society of Automotive Engineers, F. E. Moskovics, president of Stutz Motor Car Co. of America, Inc., said the opportunity for the engineer who is working to improve the automobile is greater today than ever before.

In this stage of refinement and development Mr. Moskovics said the public is prepared to accept new things, no matter how radical they may appear as compared with the old, provided these new things prove their right to exist by performing a real service in a better way. The opportunity for new meritorious articles is unlimited, he said.

Oakland Plans 200,000 Year

DETROIT, March 12—The Oakland Motor Car Co. has a production program for 200,000 automobiles in 1927, A. R. Glancy, president, stated upon the occasion of the opening of the new Pontiac factory. In 1926 the company built a total of 143,000 Oakland and Pontiac automobiles.

Velie Sales 49% Ahead

MOLINE, ILL., March 12—Velie Motors Corp. reports February shipments were 61.7 per cent greater than February of last year. This follows an increase in November, December and January amounting to 49 per cent in excess of business done the same months of the preceding year.

Chandler Signs 45 Dealers

CLEVELAND, March 12—Chandler-Cleveland Motors Corp. announces the appointment of 45 new Chandler distributors and dealers. Points covered are: Regina, Sask.; Los Angeles, Chicago, Poughkeepsie, N. Y.; Evansville, Ind.; Jackson, Mich.; Detroit, Ann Arbor, Mich., and Culver City, Cal.

Balloon Casing and Tube Inventory Cut

Slight Boost Noted in High
Pressure Casings—Balloon
Output, Shipments Mount

NEW YORK, March 15—Inventory reductions of inner tubes and of balloon casings as of Feb. 1 are shown in the report by the Rubber Association of America, Inc., with a slight increase in the inventory on high pressure casings. Production and shipments of balloon tubes and casings show increases. High pressure tubes showed reduced production with a slight increase in shipments. Both production and shipments of high pressure cord casings were lower.

Comparative figures follow:

	Inventory Production Shipments		
	Balloon Casings	Balloon Tubes	Cord Casings
Jan. 1927	3,119,263	1,793,778	1,794,623
Dec. 1926	3,141,505	1,502,724	1,537,085
Jan. 1926	2,195,922	1,416,409	1,000,490
Jan. 1927	3,977,723	1,840,966	1,965,152
Dec. 1926	4,133,865	1,440,646	1,628,872
Jan. 1926	2,473,366	1,569,248	1,085,352
Jan. 1927	4,067,010	1,785,904	1,744,469
Dec. 1926	4,047,557	1,857,821	1,861,272
Jan. 1926	4,453,490	1,621,383	1,045,392
Jan. 1927	7,711,148	2,161,600	2,547,121
Dec. 1926	8,016,198	2,517,035	2,468,262
Jan. 1926	8,297,117	3,537,722	1,706,680
Jan. 1927	163,635	42,693	41,080
Dec. 1926	164,294	44,489	38,557
Jan. 1926	170,674	57,928	34,361

Parley to Stress Smaller Makers' Export Problems

DETROIT, March 14—The fourteenth national foreign trade convention to be staged here May 25 to 27 under the auspices of the National Foreign Trade Council will concentrate attention on the export problems of smaller manufacturers. There will also be extensive foreign trade discussion promoted by the automotive industry. The farmers' problem in foreign trade also will occupy a prominent place.

A new session on export merchandising will be staged under the auspices of the American Exporters' & Importers' Association to outline means to closer cooperation from manufacturers and other producers engaged in foreign trade.

Sears to Sell Accessories

LOS ANGELES, March 12—The Sears-Roebuck Co. has announced early entry into the retail tire and accessory field in Los Angeles. The announcement has created somewhat of a stir here, in view of the already substantial development of competition. A temporary store will be opened at 1201 South Figueroa, to be used until a permanent home is erected. C. R. Cook, formerly merchandise manager of the Atlanta plant, has been appointed general manager at Los Angeles.

Steel Firmer with Broadening Demand

No Out-and-Out Price Advances Made, However—April Activity Dubious

NEW YORK, March 17—The much firmer attitude on the part of steel sellers encountered by consumers is due solely to the seasonal broadening of the demand from all industries. The backwardness of buying in January and February has given way to more liberal and more frequent orders.

The uppermost question in the minds of steel producers now is: how long will the upturn last? Last year, the downturn began in January and continued until July; the year before, February added to unfilled tonnage while March brought a decline that continued uninterrupted until August. This year, it looks as though March would prove one of the really good months for steel buying, but no one will venture any opinion as to what is likely to happen in April.

While the market generally is more nearly at the currently quoted price levels, concessions having largely disappeared, there have been no out-and-out price advances. If, as rumored, some consumers paid premiums on full-finished automobile sheets, the tonnages involved were hardly representative.

Sheet Market Improves

Market for sheets in general, however, as well as that for strip steel, has shed most of its raggedness. Expansion of automatic high-speed strip steel capacity appears to be the watchword of the hour with those in charge of the mechanical programs of steel mills. It is significant that the market for billets, the semi-finished material usually used by strip-mills, is now on a parity with that for sheet-bars used by sheet rollers, whereas usually the latter command a premium of \$1 over the former. Automotive alloy steel producers are operating at the year's best rate. A uniform 70 per cent discount is announced by one bolt and nut manufacturer, to apply on the new list that on April 1 is to supersede the present one.

Pig Iron—Following excellent buying by automotive foundries, the market has quieted down. Heavy commitments by the leading motor car manufacturing interests are looked for with the expansion of foundry capacity. Iron ore inquiries for the blast furnaces of the Ford Motor Co. contemplate the same tonnage as used last year. Ore producers are taking their time about quoting their figures on this business. The Detroit market is firm at \$19, furnace.

Aluminum—Routine conditions prevail. Automotive consumption is of seasonal proportions. A conservative attitude is shown by buyers. Secondary metal is in good demand, with prices steady.

Copper—What curtailment in output may have taken place, is not yet felt in the market, which rules very quiet. Marked improvement has taken place, however, in the volume of automotive brass demand.

MERCEDES TO SELL \$4000 CAR IN U. S.

NEW YORK, March 14—W. R. Vogeler, vice-president of the American Mercedes Co., Inc., has left on a visit to the Mercedes factories. The Mercedes company is soon to bring out a new car which will sell in the United States for about \$4000. On his return Mr. Vogeler plans to organize a distributing organization to sell the new car throughout the country.

The market for raw copper is fairly easy, that for copper and brass products steady.

Tin—Spot Straits tin is in light supply. Some German metal is being offered. Prices continue higher than consumers' ideas of values.

Lead—On the market's upturn, storage battery manufacturers are reported to have bought liberally. Most market observers look for further advances.

Zinc—The market is just about holding its own.

Larger Bus Sale Seen in Argentine Market

WASHINGTON, March 16—Buses and coaches as a means of public transportation in the city of Buenos Aires are growing rapidly in popularity, says a report from the American consul there to the U. S. Department of Commerce.

Figures for the month of December show that a total of 13,996,057 passengers were hauled by the omnibus transportation companies of the city, which is served by 44 companies, employing a total of 513 machines. There are 23 companies, operating 10 or more machines each, and indications are, the report says, that new buses will be added rapidly.

Hungary Favors France

WASHINGTON, March 16—Import duties on pneumatic tires are to be increased from 140 gold crowns to 220 gold crowns per 100 kilos, and the duty on solid tires brought in is to be increased from 6 to 80 gold crowns to 135 gold crowns per 100 kilos, under the provisions of a special agreement just entered into between France and Hungary, according to advices received by the rubber division, U. S. Department of Commerce. Under the treaty French manufacturers of tires are to be given preference. Imports from the United States are subject to conventional rates of duty in Hungary, and therefore, would be affected by the increase.

Servel Speeds Body Work

EVANSVILLE, IND., March 14—The commercial body building division of Servel Mfg. Co. is building Chevrolet truck bodies at the rate of 200 a day. This output will be increased to 300 a day in the spring. This division shows a 20 per cent increase in production and sales over early 1926 business.

New French Tariff to Reduce Maximum

List of Specific Duties Also Compiled—Penalties Stir Importer Protests

PARIS, March 2 (by mail)—Under the French tariff act expected to go before the Chamber within a couple of weeks, a maximum duty of 70 per cent ad valorem and a minimum duty of 45 per cent will be applied to passenger carrying automobiles. The present duty is 180 per cent maximum and 45 per cent minimum. In addition to the ad valorem duty, specific duties are provided for, it being understood that whichever tariff is higher, will be applied. The specific duties, for automobiles complete with bodies or for chassis without bodies, are as follows:

	francs
750 kilos and less, per 100 kilos....	825
751 to 870 K., " " "	925
871 to 990 K., " " "	1,025
991 to 1,100 K., " " "	1,075
1,101 to 1,230 K., " " "	1,175
1,231 to 1,350 K., " " "	1,250
1,351 to 1,470 K., " " "	1,325
1,471 to 1,590 K., " " "	1,400
1,591 to 1,710 K., " " "	1,500
1,711 to 1,830 K., " " "	1,575
1,831 and more kilos; " " "	1,650

During the past few months friction has arisen between American automobile importers and French customs officials, the latter refusing to accept the importers' declaration of value and in some cases imposing a fine for false declaration although the importer has proved that the price given was the amount he paid for the car. In such cases the officials fix an arbitrary value on what they consider it would cost to build the car in France.

Recently six Packard cars were protested and although five of them were admitted the sixth was held as a guarantee against payment of duty. Studebaker values have been protested and the Paige-Detroit representative has been fined for what is an alleged under-estimation of value. The three firms have lodged protests.

Cuban Highway Begun

WASHINGTON, March 16—The contract for the great Central Highway of Cuba has been signed and work commenced in four different provinces, the U. S. Department of Commerce was advised this week. The estimates for the final cost have risen from \$56,000,000 to \$77,000,000. The highway will be 700 miles long. All work is being done on the "unit price" basis.

Separator Firm Organized

INDIANAPOLIS, March 14—The Indianapolis Box & Separator Co. has been organized to take over the Indianapolis Cigar Box Co. for the manufacture of wood separators for all types of storage batteries. G. T. Purves is president of the new company.

Gain in Employment is Made in Industry

Condition Less Favorable in Michigan Automobile Plants —Ohio Absorbs Surplus

WASHINGTON, March 14—Employment conditions remained virtually at a standstill in February, except in the automotive industry which shows a gain in employment, with indications pointing to further increases in March, it was announced this week by the U. S. Department of Labor. Very few other major industries showed increases, while decreases were noted in several lines.

In Michigan the automobile industry is in less favorable condition than anywhere else in the country, with considerable unemployment the rule. There was a slight increase in employment in February but some automobile plants were still working on part time. Surplus labor is being absorbed in Ohio, with tire plants working on fair schedules and increased employment expected. Automobile production is increasing in Wisconsin.

Conditions in the large automobile centers follow:

Detroit—Some automobile plants are working part time. No plants are working overtime and there has been a large decrease in factory employment.

Flint—Automobile plants are working overtime in some departments and in some instances are employing night shifts.

Grand Rapids—Automobile plants are working overtime in some departments.

Lansing—There is a surplus of automobile factory labor in this city and there is no immediate possibility of this surplus being reduced.

Racine—Owing to the curtailment of automobile production the subsidiary plants are also operating on part-time schedules.

Akron—Increased employment in the tire industry is expected during March.

Private Backing for U. S. 1927 Schneider Cup Entry

NEW YORK, March 10—It is expected that America will be represented in the 1927 Schneider Cup race to be held in Italy by a privately financed expedition. The plane which, according to reports, is being specially built by Messrs. Booth and Thurston, inventors of the wing radiator and well-known designers of high-speed airplanes, will probably be powered with a new engine developed by the Packard Motor Car Co., developing in excess of 1000 hp. Lieut. Al. Williams will be the pilot.

Navy Receiving Design for 6,000,000-cu. ft. Airship

WASHINGTON, March 15—The U. S. Navy is receiving designs and specifications for a rigid airship 780 ft. long, with a maximum diameter of 130 ft. and a cubic lifting gas capacity of 6,000,000 cu. ft., as against 2,300,000 for the Los Angeles, it was announced here this week.

General plans were announced two days after the British Ministry of the Air had announced plans for two 5,000,000-cu. ft. ships. The proposed ship will have a cruising range of 4000 miles without refueling, a maximum speed of 70 m.p.h., and room for 200 passengers. Plans call for its completion in 1930.

Designs are to be selected by the U. S. Bureau of Naval Aeronautics in a \$50,000 prize competition open to engineers of all nations. The contract will be let to an American firm. Designs must be submitted by May 16 and awards will be made in July.

Otis Steel Records Further Profit Gain

CLEVELAND, March 14—The 1926 annual report of the Otis Steel Company shows that, after allowing \$720,000 depreciation, \$2,563,376 for maintenance and other charges and \$40,000 federal taxes, the net profits were \$1,907,314, equal to \$1.46 a share on common stock. This compares with net profit of \$1,404,387 in 1925, equal to 78 cents a share on common, and to a deficit of \$1,479,141 in 1924.

Working capital of \$6,540,708 shows an increase of \$3,297,824 over Dec. 31, 1924, notwithstanding expenditures of \$7,334,376, including \$4,931,698 for repairs, renewals and maintenance, and \$2,402,477 charged to capital account.

Through the refunding of 7½ and 8 per cent bonds with a \$12,000,000 issue this year, the company received \$1,737,354 net. This, in addition to \$212,164 from the sale of capital assets, gave it \$1,949,518 of new money. Cash and securities showed an increase of \$2,084,767. Inventory was \$1,087,693 higher than 1924.

Cash, government securities and receivables are \$724,824 in excess of current liabilities.

E. J. Kulas, president, gives much of the credit for the company's improved position to R. H. Clarke, vice-president in charge of operations, and J. G. Caruthers, general manager of sales.

Wood-Staining Machine Adds to Graham Output

EVANSVILLE, Ind., March 14.—Dodge Brothers, Inc., expended about \$250,000 in building and equipment improvements at the Graham Brothers truck division plant here during 1926. Outstanding improvements include a new enameling room with force feed oil-burning furnaces; a new tool room to meet plant needs for dies, jigs and vamps; improved types of drilling and reaming machines, and quantity production woodworking machines, including a machine which cuts and finishes 50,000 ft. of lumber per day.

An interesting addition is a machine for staining lumber. It consists of a series of metal compartments through which the wooden truck parts carried along on moving platforms are automatically stained and dried. It can treat 60,000 ft. of lumber per day.

Financial Notes

Hayes Wheel Co. in 1926 earned \$308,321 after charges and taxes as against \$1,719,005 in 1925. This is equivalent to \$1.01 a share on 197,044 shares outstanding in 1926, against \$8.02 a share in 1925. Sales for 1926 were \$9,753,481 against \$16,484,833 in 1925, and expenses were \$9,493,891 against \$14,540,532, leaving a gross profit of \$259,590 against \$1,944,301. Total income was \$391,629 against \$2,086,062. After dividends there was a deficit of \$440,808 in 1926, against a surplus of \$891,484 in 1925. The balance sheet as of December 31, 1926, shows total assets of \$7,335,333 against \$9,550,497, and surplus of \$3,901,906, against \$4,352,244. Inventories of \$1,525,255 compare with \$2,038,558 and cash was \$1,640,810 against \$2,503,972.

Allith-Prouty Mfg. Co. has organized with a capitalization of \$668,000, a surplus of \$300,000 and funded indebtedness of \$200,000, operating two plants of a conservative appraised value of \$1,250,000. Donald E. Willard and his associates are in charge of the factory, planning development of new lines, change in sales policy and extension of sales organization.

Miller Rubber Co. annual financial statement shows net operating profits of \$1,025,454.73. President Jacob Pfeiffer stated that the financial position of the company is sound, with current assets aggregating \$16,890,968.18, and current liabilities amounting to \$5,307,000.21, or a net working capital of \$11,583,967.97.

Lee Rubber & Tire Corp. and subsidiaries report for year ended Dec. 31, 1926, net loss of \$1,670,068 after expenses, depreciation, interest and inventory adjustment. This compares with net income of \$300,208 or \$1.39 a share earned on 214,837 no par shares of stock in 1925.

Record Crowds Attend Cadillac National Salon

DETROIT, March 14—The Cadillac Motor Car Co. reports that crowds attending the national spring salon of that company being held in the showrooms of distributors and dealers throughout the country, are breaking all records, more than 10,000 persons attending the salon in Detroit during the first four days. A feature of this year's spring salon is the initial showing of the new LaSalle car.

Reo on Record Basis

LANSING, March 12—Reo Motor Car Co. in February enjoyed the largest passenger car business based on valuation, for any single month in its history. Not since July, 1917, when the company was building a car that retailed for \$875, have as many passenger car units been sold in a single month, the factory reports. Production is being steadily increased to meet the demand and the company expects that the March output will exceed that of February by 50 per cent. The volume of unfilled orders for current shipment exceeds any previous total.

Industry's Executives Pay Murray Respects

Founder of J. W. Murray
Mfg. Co. Suffers Paralytic
Stroke and Dies

DETROIT, March 14—John W. Murray, founder and for many years president of the J. W. Murray Mfg. Co., who died last Friday after a two weeks' illness of paralysis, was buried this morning. Many men prominent in the automotive industry and close associates of the late Mr. Murray gathered at Holy Rosary Catholic Church to pay their final respects.

With the death of Mr. Murray, who was chairman of the board of directors of the J. W. Murray Mfg. Co., and member of the executive committee of the Murray Corp. of America, there was removed from the industry another of its pioneer and well-known executives. Mr. Murray was 69 years old and passed away at the family residence where he had been confined since Feb. 26, when he suffered the stroke of paralysis. He had been active in his business up until the day he was taken ill.

Opened Machine Shop at 20

Mr. Murray was born in Washtenaw county, near Ann Arbor, Mich., April 20, 1858, and when a child moved with his parents to Saginaw where he was educated in the public schools. At the age of 20, he opened a small machine shop and foundry at Cheboygan, Mich., with his brother Andrew. In 1885 he was married to Miss Harriett Elizabeth Rappin, of Cheboygan, and soon after returned to Saginaw where he resided until 1890, when he was made superintendent of the Jenison Mfg. Co., of Jenison, Mich., manufacturer of railroad appliances. He remained there until 1894, when he moved to Chicago and formed his own company to manufacture bicycles.

In 1909 he organized the Knox Independent Metal Wheel Co., in Knox, Ind., to manufacture small metal rubber tired wheels for bicycles, buggies and velocipedes. Later that same year he had his first venture in the automobile manufacturing field when he was elected president of the Kalamazoo Mfg. Co., maker of small metal parts for automobiles.

Formed Body Company

In 1910 Mr. Murray moved to Detroit to become a director and factory manager of the Michigan Stamping Co., in charge of making sheet metal parts for automobiles. He remained with this company until April, 1913, when he formed the J. W. Murray Mfg. Co., builder of automobile bodies. Besides his connections with the Murray Corp. of America and the J. W. Murray Mfg. Co., he was also a director of the Murray-Ohio Mfg. Co., of Cleveland.



John W. Murray
Founder of J. W. Murray Mfg. Co.,
whose death followed paralytic stroke

Besides his widow, Mr. Murray leaves one son, J. R. Murray, and two daughters, Mrs. J. T. McHugh, of Detroit, and Mrs. C. W. Hannon, of Cleveland. He is also survived by two brothers, Frank, of Detroit, and Andrew, of Saginaw, and two sisters, Ella and Margaret, both of Saginaw.

2-Pass. Electric Roadster Introduced—Makes 10 m.p.h.

NEW YORK, March 14—A miniature two-passenger electric roadster weighing only 200 lb. was introduced to the public today at the seventh annual electric truck show. It has a 62-in. wheelbase and is said to be capable of a speed of 10 m.p.h.

The chassis is of the buckboard type, with ash slats, and the wire wheels are supplied with oversize pneumatic tires. An electric motor similar to the starting motor of a gasoline automobile drives the rear wheel by a gear train. It is claimed that the standard storage battery will drive the car 20-30 miles, depending on the road, on a single charge. Both brakes and the two-speed motor control are operated by pedal.

It will sell for \$300 complete.

Court to Review Award

PHILADELPHIA, March 14—The award of \$450,000 damages in favor of Charles H. Machen against Budd Wheel Co., for development of a manufacturing process, will come before the three judges of the common pleas court sitting as a court for determination as to its correctness, following the procedure of the Pennsylvania courts. Upon the result of this determination will rest decision as to further action.

Equipment Exhibits Prove Sales Stimuli

January - February Volume
Above Last Year—Makers
Favor 1928 Displays

NEW YORK, March 14—Hearty approval of the results obtained by the segregated shop equipment exhibits in the national shows at New York and Chicago and 14 regional shows was expressed by leading makers of this class of products who met during the Boston show last week.

Service equipment, it was agreed, received definite stimulation during the early months of 1927 from the special exhibits, and in nearly all cases sales for January and February ran ahead of last year's totals, while prospects were declared excellent for new March records.

The meeting included 25 executives of shop equipment manufacturers in the membership of the Motor & Accessory Manufacturers Association, who were guests of S. A. Miles, manager of the national shows. Sentiment was unanimous for a continuance of the special exhibits next year.

Sales Volume Better

The meeting was presided over by M. L. Heminway, general manager of the M. & A. M. A., and the show discussion was conducted by Neal G. Adair, manager of the sales development department, with the assistance of C. J. Ellias of the national show staff.

An analysis made by the M. & A. M. A. shows that manufacturers' shop equipment sales throughout the country in January and February ran much farther ahead of November and December than they did a year ago, and reports up to date indicate a still greater increase in March. Inquiries made among a number of jobbers, particularly in the national show centers, revealed a substantial amount of shop equipment business already written or in prospect which could be traced directly to the shows. Several jobbers felt that the sales stimulation resulting from the shows would be felt into the middle of the year.

The Boston meeting made numerous recommendations for next year's shows which will be taken up shortly by the service equipment committee of the M. & A. M. A., headed by R. W. Procter of the Black & Decker Mfg. Co. The meeting closed with the presentation by Mr. Miles of a silver tea service to Mr. Adair in recognition of his work for the shop equipment sections of the national shows.

Ryan-Lites Repriced

ST. LOUIS, March 14—Stiver Signal Engineering Co. has announced a new schedule of prices for the Ilco-Ryan-Lite ranging from \$22.50 to \$40 a pair. Two sizes are now obtainable, 9 3/4 in. and 11 3/4 in. in diameter.

No Contest for Oil Burners This Year

Event Will be Staged in 1928
—Heldt Reviews Diesel Adaptation Work

INDIANAPOLIS, March 11—At the March meeting of the Indiana Section of the Society of Automotive Engineers it was announced by T. E. Myers, secretary of the Indianapolis Speedway, that the proposed contest for oil engine-propelled vehicles on the speedway had been abandoned for this year and that new rules for a contest next year would be announced shortly.

Mr. Myers read comments on the proposed rules received from various interested parties. In general the comments were favorable, but some writers objected to certain restrictions, such as the banning of ignition devices. Mr. Watson, who is connected with the Sheet Steel Products Co., of Detroit, said he had an engine of the fuel injection type in which spark plug ignition was used, together with a small percentage of volatile fuel, the vapors of the latter being ignited by the spark plug and the flame then being communicated to the less volatile fuel.

Another communication was from Mr. McCollum, co-inventor of the single sleeve Burt-McCollum engine, who is now in this country and who has developed an oil-burning engine. The Vapor Oil Co. of London wrote that it had carried out a series of experiments looking toward the conversion of American truck engines to the use of fuel oil by fitting them with new cylinder heads. Several Fiat trucks also had been fitted with this device.

The Portable Diesel

C. L. Cummins, president of the Cummins Engine Co., Columbus, Ind., gave a talk dealing with the portable high speed Diesel engine in general and the type developed by his company in particular. The Cummins company some four or five years ago took out a license under the Hvid patents, but in its experiments with the Hvid engine found that the fuel injection problem had to be solved along different lines, and Mr. Cummins described a system of fuel introduction invented by him, by which the fuel is given practically the same time as in the carburetor engine to heat up and vaporize and is then forced into the combustion chamber positively by means of a plunger. The Cummins engines are used for power shovels and for lighthouse generating sets.

W. W. Schettler, chief engineer of the Foos Gas Engine Co., Springfield, Ohio, described the new Foos Model L Diesel engine, which, although of the high-speed type, is probably too heavy for automotive uses other than on rail cars. An illustrated description of this engine will appear in *Automotive Industries* in the near future.

P. M. Heldt, engineering editor of *Automotive Industries*, gave a review of the work done up to date with a view to adapting the Diesel engine to various classes of automotive work, both here and in Europe, and also outlined some of the engineering problems involved. Air services are much interested in the development of the oil engine for aeronautic purposes because of the elimination of practically all fire hazards, and the work of Junkers, Garuffa, Beardmore, Attenu and Sperry along this line was mentioned. A number of truck and tractor engines of the oil-burning type developed in Europe were also briefly described and illustrated by lantern slides.

As the available time was fully taken up by the four speakers, the usual discussion had to be dispensed with, which was rather unfortunate in view of the interest in the subject and the fact that several engineers with experience in this line of work were present and might have contributed valuable information.

Racing to Rise to New Heights in '27

WASHINGTON, March 16—A prediction that 1927 will be outstanding in the achievements of automobile racing, is made here by Captain E. V. Rickenbacker, chairman of the contest board of the American Automobile Association.

Things that indicate this, he points out, are (1) the entrance of the contest board into the Sportive Commission Internationale, thus giving racing a world-wide aspect; (2) the advent of new makes of automobiles into the American racing schedule; (3) the decision of the Society of Automotive Engineers to watch racing cars closer with an idea of improving wherever possible, and (4) because of the growing interest of the public in such sports.

Preliminary figures indicate that the board will supervise about 12 speedway events and 150 dirt track tournaments, and allot \$350,000 prize money on speedway events and \$250,000 on dirt tracks.

Cotta Expands Plant

ROCKFORD, ILL., March 12—Construction will start this month upon a \$10,000 addition to the Cotta Gear Co. plant to provide facilities for production of a new gear transmission for large truck and bus firms. A modern type heat treating plant will be a principal item of the new work and equipment will make possible manufacture of a new type of transmission equipment for greater speed.

McKinnon Office for Gotham

COLUMBUS, March 14—Columbus McKinnon Chain Co. has opened an eastern sales office in the Grand Central Terminal, New York, with William Koch in charge of industrial chain sales and J. J. O'Hara manager of automotive sales.

Fifth Avenue Coach Tests Steam Engine

Experiments Embody Automatically Operated Boiler of Water Tube Type

NEW YORK, March 12.—The Fifth Avenue Coach Co. is experimenting with a standard bus chassis driven by a steam engine with a new type of automotive boiler. The vehicle is reported to combine flexibility and economy, the costs of fuel and maintenance being estimated at one-third the costs of a standard gasoline engine. The boiler operates automatically. Frank J. Curran perfected the type. Tests of the new device are under the supervision of L. H. Palmer, vice-president of the company, and William McClellan, consulting engineer.

The tests are reported not far enough along to determine definitely results under actual working conditions. Dr. McClellan said, however, that if the tests prove as successful as he expected the result would be almost revolutionary in its effects on heavy duty automotive engineering on heavy grades and in countries where gasoline is high-priced.

The boiler used in the tests is of water-tube type, designed to generate large quantities of steam immediately. It is built to withstand a pressure of 3000 lb. to the square inch and operates at 800 lb. In the boiler itself there are 27 gal. of water under this pressure. The boiler operates with any kind of liquid fuel and when the engine stops no steam is consumed. Both boiler and engine may be installed in any truck chassis after removal of the clutch and transmission gears, it is reported.

Dr. McClellan is a former president of the American Institute of Electrical Engineers and has designed numerous large power installations.

Traffic Survey for Boston

BOSTON, March 14—The city council has appropriated \$25,000 for a comprehensive traffic survey of the Boston metropolitan area under the direction of the Albert Russel Erskine Bureau for Street Traffic Research. The study is expected to provide data for the installation of an efficient system of traffic control. The Boston survey will be the fourth detailed metropolitan study made by the Erskine Bureau, which is endowed in Harvard University by a grant of the Studebaker Corp. of America.

Opens Richmond Warehouse

PHILADELPHIA, March 14—The Consolidated Battery Co. has opened a warehouse at Richmond, Va., to take care of rapidly expanding business in the southern states. The warehouse is under the supervision of A. B. Cardwell, who has been district representative in this territory for the past two years.

Boston Show Sales Found Satisfactory

Attendance Reaches New
High Total—Ford New
Plant Draws 75,000

BOSTON, March 12—Boston's silver anniversary automobile show came to a close with a new record for paid attendance and a satisfactory showing in sales. Some companies exceeded the number sold a year ago. At the sales meetings there was not much of the general forcing of cars on the dealers. There was less of the long-winded talks, the aim being to let the men get back to the shows as early as possible.

Over in Somerville Ford Motor Co. was keeping open house all week to show the new assembly plant. The Ford company will give a new car to the visitor holding a number to be selected. The crowds were so large that each day they had to be divided into sections. A visitor who went over Thursday evening and filled out a card, received a coupon in the 64,000 class. It is estimated that more than 75,000 people visited the plant during the week.

The truck men are satisfied with the show, and the exhibitions they held in their salesrooms.

Many of the dealers are going to keep open evenings for the next few weeks to meet the demand they expect to follow the show.

Los Angeles Draws Record Crowd

LOS ANGELES, March 12—More than 100,000 people attended the fourteenth annual Los Angeles automobile show. This established a new mark for local automobile exhibitions. Virtually all of the distributors and dealers exhibiting reported an excellent response in actual sales as a result of show contacts. The after-show results have also been very favorable.

Plan Aircraft Exhibit

WASHINGTON, March 12—Plans were formulated this week to hold an aeronautical show here early in May. Representatives of manufacturers of aircraft and related commodities met representatives of the government to arrange plans for the exhibit. It was voted to invite Canadian manufacturers to participate. No contests are to be staged in connection with the show.

Gets Air Mail Contract

WASHINGTON, March 16—A contract has been let to T. Clifford Ball, of McKeesport, Pa., for \$3 a pound, for the carrying of mail by airplane between Pittsburgh and Cleveland, via Youngstown and McKeesport, beginning April 21, it was announced here this week by the U. S. Post Office Department. The schedule has not yet been arranged.

SESQUI VEHICLES ELICIT POOR BIDS

PHILADELPHIA, March 14—Bids received for motorized equipment used during the Sesqui-Centennial exhibition here were so low as to be almost negligible. The equipment included 15 passenger cars, 10 trucks, one bus, one police patrol, five tractors, 10 trailers and three motorcycles with side cars.

A New Jersey town official bid \$50 for the patrol but another town which needed a patrol worse bid \$135 and got it. One bidder offered \$3150 for all the passenger automobiles and another was willing to part with \$17 for a large sedan. The high bid for the bus was \$850. All bids were subject to disapproval.

3 Companies Share Navy Plane Awards

WASHINGTON, March 12—Contracts for 130 airplanes to cost \$1,708,967 were awarded this week by the U. S. Navy Department. The contracts cover 59 fighting planes, 70 training planes and a Ford transport plane, the latter costing \$40,000.

The contracts went to the following successful bidders:

Consolidated Aircraft Corp., \$672,000 for training planes; 32 attack planes, Boeing Airplane Co., \$515,650; 27 fighting planes, Curtiss Aeroplane & Motor Co., Inc., \$480,450.

Army Fliers Try Out New Demountable Wing Plane

MILWAUKEE, March 12—Tests are now being made by United States Army pilots of an all-metal monoplane, designed by Thomas Hamilton, president and chief engineer of the Hamilton Mfg. Co.

The plane has a shatter-proof glass inclosed cabin with accommodations for five passengers and the pilot. The cabin extends into the side wings, giving an inside width of eight feet. The plane is powered with a 200 hp. Wright Whirlwind engine. The wings are demountable so the ship may be transported along city streets. In the assembling test the wings were removed from the fuselage in 20 minutes and the replacement was approximately as rapidly accomplished.

WRIGHT GETS ARMY AWARD

WASHINGTON, March 16—Contracts totalling \$1,465,000 for the purchase of engines, planes and other air equipment, were let during February by the Army Corps, it is announced here. The bulk of the business went to the Wright Aeronautic Corp. which, in addition to new equipment, received a contract for reconditioning 90 Wright E war-time engines.

14 Companies Rank in Magazine Elite

Four Spend Over Million for
Space and 10 Over Quarter
of a Million

NEW YORK, March 17—Four automotive companies are among the 13 American concerns which spent more than \$1,000,000 for national magazine advertising in 1926, according to a tabulation in the Denny National Advertising Records. General Motors Corp. heads the list with a total expenditure for all divisions of \$4,683,826. Chrysler Corp. spent \$1,264,781; Dodge Brothers, Inc., 1,238,449, and Willys-Overland, Inc., \$1,103,888.

The five passenger car units in the General Motors organization and their expenditures are listed as follows:

Chevrolet Motor Co.	\$972,144
Buick Motor Co.	970,534
Cadillac Motor Car Co.	472,130
Olds Motor Works	446,896
Oakland Motor Car Co.	322,600

Other passenger car companies which are ranked among the 125 leading advertisers in this field for the year are:

Packard Motor Car Co.	\$709,160
Nash Motors Co.	449,250
Paige-Detroit Motor Car Co.	439,150
Durant Motors, Inc.	437,490
Hudson Motor Car Co.	430,750
Hupp Motor Car Corp.	422,875
Ford Motor Co.	418,550
Studebaker Corp. of America	387,435
Franklin Automobile Co.	307,650
Lincoln Motor Co.	256,260

The passenger car companies which spent \$1,000,000 or more for newspaper advertising in 1926, according to the figures of the American Newspaper Publishers' Association, together with the expenditure in each case, follow:

Buick Motor Co.	\$1,000,000
Chevrolet Motor Co.	3,122,000
Chrysler Corp.	1,200,000
Dodge Bros., Inc.	1,800,000
Oakland Motor Car Co.	1,200,000
Olds Motor Works	1,750,000
Paige-Detroit Motor Car Co.	1,100,000
Studebaker Corp. of America	2,000,000
Willys-Overland, Inc.	1,500,000

Non-Skid Tire for Planes

AKRON, March 12—A non-skid tire for airplanes has been developed by Goodyear Tire & Rubber Co. With the adoption of landing wheel brakes on a considerable number of commercial planes in this country this development is of considerable interest. At the present time the tire is available in the 20 x 4-in. size.

Bugatti Builds Boat

PARIS, March 2 (by mail)—Bugatti is building a 2500 hp. motor boat designed to have a speed of 125 miles an hour and which will cross the Atlantic. The boat is of displacement type designed to run submerged for short periods. It will be equipped with eight 300 hp. engines of the same general type as used in its automobile.

Men of the Industry and What They Are Doing

Kelly to Join Auto-Lite in an Active Capacity

D. H. Kelly, now general manager of the United States Light & Heat Corp., and who has been for several years vice-president of the Electric Auto-Lite Co., is expected to join the Auto-Lite executives in Toledo in an active capacity within a few months. Definite date has not yet been settled by C. O. Miniger, president of both companies. It is assumed that Mr. Kelly will be given large responsibilities in the Auto-Lite organization to relieve President Miniger to some extent.

Carter Changes Officers

Carter Carburetor Corp. announces the following changes in personnel: V. J. Lowenstein, formerly replacement parts sales manager, has been made general sales manager; P. G. Sedley has been appointed sales promotion manager; Joseph Schweiss, who was recently transferred from the operating department to the engineering department, has been appointed service engineer; L. L. Lowenstein has been added to the replacement sales division in the sales promotion department.

Clark New York Manager

E. J. Clark has been transferred by the Paasche Airbrush Co. from the position of assistant sales manager at the factory, to the post of sales manager of the New York district, with headquarters in New York. Mr. Clark has had long experience in the pneumatic and electrical equipment field.

Birdsell Heads Racine Sales

Roger Birdsell has been named sales manager of Racine Radiator Co. and will have charge of sales engineering and advertising. Mr. Birdsell takes the place of F. M. Young, who resigned recently.

Leisenheimer Goes Abroad

H. J. Leisenheimer, foreign sales manager of the Cleveland Tractor Co., sailed recently on the S. S. Olympic for Europe. He will visit the British Isles and the Continent, calling on Cletrac dealers and distributors. He will be gone several months.

To Make Electric Brake

BELOIT, ILL., March 12—The Warner Mfg. Co. will erect a new foundry and extend its plant production schedules at its South Beloit factory to manufacture an electrically motivated mechanical brake for Warner trailers and automobiles. Lawrence P. Warner, general manager of the company, announced the plans this week. The Warner brake is self-energizing and uses electric current only to bring a disk magnet in contact with the regular mechanical braking system.

YEOMAN MAKES TRAVATINE STRIKE

George W. Yeoman, well known in the industry through his long association with Continental Motors Corp., has turned his attention to the development of a travatine mine, which he has discovered in Florida. Mr. Yeoman since his retirement from Continental has been deeply interested in Florida properties, the discovery of the travatine deposits being a result of this.

Travatine is a form of limestone with a definite commercial value as a building material. It is delicately colored and has special adaptability for carving. Practically all of the travatine used in the United States is imported from Italy where it is extensively used as building material in some sections. The extent of the Yeoman deposits is estimated at 25 to 35 million cubic feet and the borings show it to be in strata formation, making it easy to remove.

Bahr on Pacific Coast

F. C. Bahr, of Detroit and Minneapolis, general manager of Arrow Head Steel Products Co., is now on the Pacific Coast for merchandising conferences with the company's west coast sales organizations. Mr. Bahr recently returned from abroad and reports a rapidly growing overseas business.

Krenzke Now With Fawick

William F. Krenzke has resigned as chief engineer of the motor car division of the J. I. Case Threshing Machine Co., effective March 15, and has affiliated himself as engineer with the Thos. L. Fawick Co., Racine, Wis., designing engineer and maker of gears and transmissions.

Morgan Goes With T. & W.

F. N. Morgan, formerly southern representative of the Rickenbacker Motor Co., has taken over the general managership of the T. & W. Mfg. Co., of Little Rock, Ark. He will make his headquarters at Little Rock.

Amilcar in Liquidation

PARIS, March 8 (by mail)—The Amilcar Automobile Company, officially known as the Societe Nouvelle pour l'Automobile went into liquidation this week. The company has a capital of 13,000,000 francs and produces various types of light cars at its works at St. Denis, near Paris. Arrangements are being made to refloat the company.

General Motors Export Takes on New Officials

J. D. Mooney, president of General Motors Export Co., is in South America, where he will make a tour of the assembly operations before returning to New York. R. K. Evans, regional director of the export company for Europe, has been made a vice-president. Robert R. Thien, formerly with McManus, Inc., has joined the sales department as advertising manager.

A. M. Ruiz of General Motors Peninsular has been made sales manager of the Spanish operation. M. A. Flannery has been made sales manager, and J. A. Morris, supply manager, of General Motors South African, Ltd.

Moskovics Finds Outlook Good

F. E. Moskovics, president of the Stutz Motor Car Co. of America, Inc., returned this week from an extensive tour of the Pacific Coast upon which he started while the Chicago show was in progress. He visited Stutz distributors and dealers throughout the west and also talked before a number of meetings. Mr. Moskovics reported the automotive outlook generally favorable.

Weaver Appoints Benedict

G. W. Benedict has been appointed service engineer of the Weaver Mfg. Co. to assist in the further development of the Weaver service promotion program. Mr. Benedict designed special tools for automobile manufacturers for several years and later served as service promotion manager for Chevrolet on the Pacific Coast.

Lyman Assigned to St. Louis

H. F. Lyman, special representative of the Chandler-Cleveland Motors Corp., has been assigned to St. Louis. He will work with the distributors in establishing Chandler dealers in St. Louis and in the St. Louis district.

A.E.A. Sets 57 Meetings

CHICAGO, March 10—Fifty-seven merchandising meetings under the auspices of the Automotive Equipment Association appear on the tentative schedule between March 10 and the latter part of April. Of the meetings, 33 will be held before the end of the present month, with 24 on the tentative slate for April.

Thomas' Death Probed

LONDON, March 8 (by mail)—Investigation has disclosed that the accident which caused the instant death of J. G. Parry Thomas, noted British racing driver, at Pendine Sands, Wales, March 3, was probably due to a broken driving chain. The accident occurred during an attempt to lower Capt. Malcolm Campbell's record of 174.2 m.p.h.

28 American Makes in Genevan Exhibit

U. S. and French Cars Dominate Biggest Show Held in Switzerland

PARIS, March 9 (*by mail*)—Occupying a floor area of 86,100 sq. ft., with 40,000 sq. ft. of galleries, and containing 88 makes of cars, the Geneva automobile show is the biggest ever held in Switzerland and the most international on the continent of Europe. While the leading makers of Italy, Germany, Belgium, Austria and Switzerland are represented, the dominating positions are occupied by France and the United States, the former country having 30 makes of cars and the latter 28.

Competition on this market is keen between France and America, the former having the advantage in the number of cars imported and the latter in total values. Last year the number of French cars imported into Switzerland was 3742, while the number of American machines was 3588. The French machines were mostly small models built by Citroen, Renault, Peugeot, etc., having a declared value of 22,725,000 Swiss francs, while the value of the American machines was 29,000,000 francs.

Swiss automobile production is very limited, the only makes represented at the show being Saurer, Berna, Martini, and Maximag.

6,000,000 Acres Suited to Rubber in Tropic America

WASHINGTON, March 14—The possibilities of rubber production in northern tropical America are discussed at length in a report made public here this week by the U. S. Department of Commerce.

The report shows that there are at least 6,000,000 acres of land in South America and Central America adapted by climate and soil to successful rubber production, which can be obtained by concession, lease or purchase at a low figure, all of them having ports within eight days' sailing time of the United States.

The chief handicap to successful development is the high wage scale obtaining generally in the sections available for such growing. The introduction of rubber cultivation would be considerably less costly than in the available lands of Sumatra and Malaya, it was reported.

Victor 40 Cut \$700

ST. LOUIS, March 15—Victor Motors Co. has reduced its model No. 40, 2½-ton capacity, including body, from \$1995 to \$1295. Coincident with the price change the axle has been changed for semi-floating double reduction to full-floating. The company is aiming at a production of 50 daily on all models.

FEBRUARY SALES RECORD FOR BUICK

DETROIT, March 14—With retail deliveries of 14,338 cars, the month of February recorded the largest sales volume ever reached by the Buick Motor Co. during this month, according to C. W. Churchill, general sales manager. The best previous February record was reached in 1926, but was 1750 cars under this year's figure.

Buick production for March has been rescheduled at 1100 a day.

The total sale of 1927 models for the seven months up to March 1 exceeds the high record of 1926 by over 14,000 cars, Mr. Churchill says.

Citroen to Expand

Advertises for 10,000 Workers —Output Aim 400 a Day

PARIS, March 6 (*by mail*)—By page advertisements in the daily newspapers, Citroen is advertising for 10,000 workmen and employees for his various plants in and around Paris. Such a move, coming at a time when Paris and district has 80,941 official out-of-works, of which 12,378 are in the metal-working industries, has caused a surprise. Police are required to hold back the applicants.

Important transformations are being carried out in the various plants, in order to increase the output to 400 units a day, which figure it is expected will be attained by early April.

The Citroen body plant at Paris is now being equipped for nitro-cellulose painting of all models, Valentine material being used.

Seiberling Has Tires for Canada Made in Toronto

AKRON, March 16—Arrangements have been made by the Seiberling Rubber Co. with the K. & S. Tire Co., of Toronto, Canada, whereby Seiberling "All Tread" tires will be manufactured in the K. & S. plant for sale in Canada. The Toronto factory has a capacity of about 2500 tires a day.

Seiberling is reported to have made the contract with K. & S. to take care of its growing export business.

Air Taxi in Production

NEW YORK, March 15—The Fairchild Aviation Corp. of New York has placed in production the first aerial taxicab in America which is being built at the rate of one a week, according to Sherman M. Fairchild, president and designer. The company has contracted for a 60 x 160 ft. building to be erected alongside its main plant at Farmingdale, L. I. When finished, production will be increased to two a week. The air taxicabs accommodate five passengers and are Wright-engined.

Knudsen Sights Good Business for Spring

Says Activity is 20 Days Ahead of Schedule With No Untoward Signs Evident

DETROIT, March 14—Favorable conditions throughout the country point to a satisfactory spring automobile business, in the opinion of William S. Knudsen, president and general manager of the Chevrolet Motor Co.

Pointing to statistics prepared by the United States Department of Commerce for the period from Jan. 1 to June 30, which show that 2,054,561 cars were sold in 1924; 2,173,525 in 1925, and 2,450,780 in 1926, Mr. Knudsen stated that while these figures show business on the upgrade generally, there are only two reasons which could be advanced for a possible decrease in sales—first, reaching the so-called "saturation point" and second, a general decline in business producing a reactive tendency in buying.

Declaring that the saturation point is still a problem of the future, Mr. Knudsen said that as for the general trend of business, "country-wide reports show the usual spring activity is opening up 20 days ahead of schedule. With the winter fairly mild, marked only by severity in spots, rapid acceleration of municipal and private construction operations is indicated. Farming should start early due to the good weather and manufacturing operations generally are in excellent condition."

Duesenberg Brings Out 110 m.p.h. Sport Model

INDIANAPOLIS, March 14—A new Duesenberg open sport model with a number of mechanical and body improvements is announced by Duesenberg, Inc.

This car is powered with a Duesenberg straight-eight engine with a maximum road speed of 90 miles per hour. By installation of a supercharger, which is optional, additional speed up to 110 miles per hour is said to be available. Hypoid gears are used in the differential making it possible to lower the height of the car.

The wheelbase is 135 in. and the frame of chrome nickel steel has an 8 in. depth and five tubular cross members, the center one being 7 in. in diameter. The body is built by Locke. The rear seat is equipped with a one-piece adjustable windshield and the top is of unusually low construction.

Gates Sales Increase

DENVER, March 14—Gates Rubber Co. reports an increase of 26½ per cent in domestic sales and of 232 per cent in export sales in the first quarter of the fiscal year ended March 1. The company has prepared a Spanish catalog for circulation in Latin America.

Detroit S. A. E. Airs Needs of Airplanes

DETROIT, March 11.—Need for developing airplane carburetors with automatic mixture controls for altitudes and the metering of anti-knock fuels, and the probability that aircraft magnetos will in future be inclosed in the crankcase of the engine were brought out at a meeting of the Detroit Section of Automotive Engineers last night.

Leonard S. Hobbs of the Stromberg Carburetor Co., explained recent developments in carburetors, pointing out the reduction in size and weight which has been effected over the past few years. Mr. Hobbs also emphasized the necessity of developing a carburetor for using hydrogen gas in dirigibles.

Thomas Z. Fagan of the Scintilla Magneto Co., Inc., described recent developments in aircraft ignition systems, including new types of spark cables and spark plugs reducing fire hazard due to corona discharge or chance of shorting. Lubrication of bearings in magnetos is now necessary only when overhauling engines with the new types of ball bearings packed in grease now used. In forecasting the inclosing of magnetos in crankcases in the future, Mr. Fagan pointed out that the logical development attending this would be to make the spark cable conduits integral with the crankcase casting. Lubrication would be positive through the regular engine oil pump and only the distributor and breaker would be external for purpose of accessibility.

Mexico Delays Surcharge

WASHINGTON, March 12—The surcharge of 5 per cent ad valorem on automotive and other imports into Mexico, which was to have gone into effect on March 7, has been suspended for an indefinite time, to give the Mexican government more time for study of the tariff schedules, the U. S. Department of Commerce is advised. The

Coming Feature Issues of Chilton Class Journal Publications

May 1—Automobile Trade Journal—Annual Big Small Town Market Number.

May 5—Motor Age—Annual Sales and Service Reference Number.

surcharge had been authorized on Feb. 4.

Altoona Speedway Names Officers and Race Dates

ALTOONA, PA., March 12—Frank P. Cramer was reelected president of the Altoona Speedway Association at the annual meeting. Mr. Cramer, one of the originators of the speedway project in this city, was selected to guide the association when formed in 1923 and has been renamed president each succeeding year. Other officers chosen were L. E. Frey, vice-president; E. L. Shellenberger, secretary; Robert P. Good, treasurer; Robert E. Fluke, W. A. Morgan and W. P. Gettman, directors, with E. J. Bigley affiliated as American Automobile Association contest board representative.

W. A. "Dick" Morgan will again direct the ensuing year's race affairs as general manager. Plans have been launched for the year's racing bill. June 11 and Labor Day, Sept. 5, have been selected as the dates for the two 1927 classics.

Japan to Cut Car Tax

WASHINGTON, March 12—Effective March 31, there will be a reduction of taxes on automobiles sold in Japan, the U. S. Department of Commerce is advised. The reductions average approximately 2.5 per cent on private cars with a maximum reduction of 6.6 per cent on commercial trucks.

French Grand Prix Draws 10 Entrants

PARIS, March 2 (by mail)—Entries for the French Grand Prix 91½ in. automobile race, to be run at Montlhery on July 3, have definitely closed with 10 cars enrolled. They comprise teams of three each from Bugatti, Delage and Talbot and one Halford car from England.

Although the number of entries is small and no more can be received, the French club has decided to hold the race, for which it is offering 150,000 francs in cash prizes. Last year French 1500 cc. racing cars were not ready and as a consequence the races were devoid of competition. A considerable amount of work has been done since, with the result that the struggle ought to be keen between the three makers. Bugatti and Talbot will race with straight-eight supercharged engines; Delage will use a supercharged 12-cylinder engine.

On the day preceding the Grand Prix the Sporting Commission Cup race will be run over the Montlhery circuit, with 20 cars. Any type of machine is eligible for this race, the only restriction being an allowance of 97 lb. of gasoline and oil for a distance of 248½ miles. The cars entered are: Four B.N.C., two Peugeots, three Lombards, two Salmsons, two Montier Specials (modified Fords), one Leroi, one Corre La Licorne, three Bugattis, one Georges Irat and one de Coucy.

Ditzler in New Plant

DETROIT, March 8.—The Ditzler Color Co. has started production in its new lacquer plant here. The plant consists of two buildings and another large unit will be added later to house its executive offices and its color grinding operations. All colors now used in the lacquer are ground in the original plant at 40 Baltimore avenue. With the new unit Ditzler now has floor space aggregating 35,000 sq. ft.

Calendar of Coming Events

SHOWS

Barcelona	April 27-May 8
Budapest	June 4-15
Cleveland	Sept. 19-23
Exposition, Public Auditorium, National Machine Tool Builders' Ass'n.	
Cleveland	Oct. 3-7
Exhibition Public Auditorium, American Electric Railway Ass'n.	
Cologne	May 20-31
International Commercial Transport Exhibition.	
London	Oct. 14-22
Olympia Passenger Car Show.	
London	Nov. 17-26
Olympia Truck Show.	
New Haven, Conn.	Sept. 6-9
Machine Tool Exhibition.	
Paris	Oct. 6-16
Grand Palais.	
Riga	April 10-17

CONVENTIONS

American Automobile Association, Annual Meeting, Philadelphia...	June 16-17
American Electric Railway Association, Public Auditorium, Cleveland...	Oct. 3-7

American Gear Manufacturers Association, Annual Meeting, Hayes Hotel, Jackson, Mich.	May 12-14
American Society of Mechanical Engineers, White Sulphur Springs, W. Va.	May 23-26
American Welding Society, Engineering Societies Bldg., New York City	April 27-29
Associated Automotive Engine Builders, Cleveland	May 26-28
Automotive Equipment Association Summer Convention, Multnomah Hotel, Portland, Ore.	June 27-July 2
Chamber of Commerce of the United States of America, Washington, May 2-5	
National Association of Automobile Show and Association Managers, Drake Hotel, Chicago	July 26-27
National Electric Light Association, Million Dollar Pier, Atlantic City	June 6-10
National Foreign Trade Council, Detroit	May 25-27
National Highway Traffic Association, Automobile Club of America, New York	April 15
National Safety Council, Stevens Hotel, Chicago	Sept. 26-30
Tire and Rim Association of America, Inc., Annual Meeting, Cleveland...	April 15

S. A. E.

Detroit, March 24—Artificial Leather and Rubberized Fabrics—By E. H. Nollau and Mr. Nickowitz.	
French Lick Springs, Ind., May 25-28—Summer Meeting.	

RACES

Abilene, Texas	July 4
Altoona, Pa.	June 11
Altoona, Pa.	Sept. 5
Atlantic City	May 7
Atlantic City	Sept. 24
Belgian Grand Prix, Spa-Francorchamps	July 9-10
British Grand Prix, Brooklands.....	Oct. 1
Charlotte, N. C.	July 18
Detroit	Sept. 10
French Grand Prix, Montlhery.....	July 3
Indianapolis	May 30
Los Angeles	Nov. 27
Salem, N. H.	June 25
Salem, N. H.	Oct. 12
Syracuse, N. Y.	Sept. 3
Targa Florio, Sicily.....	April 24